Pennsylvania Economic Association

Annual Conference
May 30–June 1, 2019

Kutztown, Pennsylvania
PENNSYLVANIA
ECONOMIC
ASSOCIATION

ANNUAL CONFERENCE

May 30–June 1, 2019

Kutztown University

Kutztown, PA

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2018 – 2019

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For submission information, see the style sheet posted at the association website – http://www.econpea.org/pub/proceedings.html.

The deadline for proceedings submissions is **July 31, 2019**.
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2019 CONFERENCE AGENDA

THURSDAY, May 30

04:00 pm – 09:00 pm **Registration** (McFarland Student Union Building Lobby, outside of Room 218)

05:00 pm – 06:00 pm **Board of Directors’ Dinner** (McFarland Student Union Building, Room 223)

06:00 pm – 08:00 pm **Board of Directors’ Meeting** (McFarland Student Union Building, Room 223)

06:00 pm – 09:00 pm **Reception** (McFarland Student Union Building, Room 250)

FRIDAY, May 31

08:00 am – 12:00 pm & 2:00 pm – 4:00 pm **Registration** (McFarland Student Union Building lobby, outside of Room 218)

07:30 am – 10:00 am **Pearson Breakfast** (McFarland Student Union Building, Room 250)

09:00 am – 10:15 am **Concurrent Sessions** (McFarland Student Union Building, Rooms 116, 157A, 157B, 312, 322, 323, 324, 325)

10:15 am – 10:30 pm **Cengage Coffee Break** (McFarland Student Union Building lobby, outside of Room 218)

10:30 am – 11:45 am **Concurrent Sessions** (McFarland Student Union Building, Rooms 116, 157A, 157B, 312, 322, 323, 324, 325)

12:00 pm – 12:45 pm **Luncheon** (McFarland Student Union Building, Room 218)

12:45 pm – 01:45 pm **Keynote Speaker**, Dr. Frank Gunter, Professor of Economics, Lehigh University (McFarland Student Union Building, Room 218)
Pennsylvania Economic Association
2019 Conference

02:15 pm – 03:30 pm **Concurrent Sessions** (McFarland Student Union Building, Rooms 116, 157A, 157B, 312, 322, 323, 324, 325)

03:30 pm – 03:45 pm **Cengage Coffee Break** (McFarland Student Union Building lobby, outside of Room 218)

03:45 pm – 04:45 pm **Fed Lecture, Mr. Ryotaro Tashiro,** Economic and Public Outreach Associate of the Federal Reserve Bank of Philadelphia (McFarland Student Union Building, Room 183)

05:00 pm – 08:00 pm **Fed Reception** (McFarland Student Union Building, Room 223)

**SATURDAY, June 1**

07:30 am – 10:30 am **Registration** (McFarland Student Union Building lobby, outside of Room 218)

07:30 am – 09:00 am **Pearson Breakfast** (McFarland Student Union Building, Room 250)

09:00 am – 10:15 am **Concurrent Sessions** (McFarland Student Union Building, Rooms 116, 157A, 157B, 312, 322, 323, 324, 325)

10:30 am – 11:45 am **General Membership Meeting** (McFarland Student Union Building, Room 183)

11:45 am **Closing**
FRIDAY, May 31, 2019

Conference Registration – McFarland Student Union Building
lobby, outside of Room 218
08:00 AM – 12:00 PM
02:00 PM – 04:00 PM

Pearson Continental Breakfast – McFarland Student Union
Building, Room 250
07:30 am – 10:30 am

Session F1: Friday, May 31, 2019
09:00 – 10:15 am

F (Friday); F1 (Friday Concurrent 1); F1A (Friday Concurrent 1 Session A)

Session F1A: General Economics and Teaching
McFarland Student Union Building Room 116 (09:00 – 10:15 am)

Chair: Sandra Trejos, Clarion University of Pennsylvania

Panel on Pedagogy in the Economics Classroom

Panelists:
Sunita Mondal, Slippery Rock University of Pennsylvania
CJ Rhoads, Kutztown University
Sandra Trejos, Clarion University of Pennsylvania
Huilan Zhang, Shippensburg University
Susan Zumas, Clarion University of Pennsylvania
Session F1B: Mathematical and Quantitative Methods
McFarland Student Union Building Room 157A (09:00 – 10:15 am)

Chair: Deborah Gougeon, University of Scranton

[1] Taming the Regression Monster
   Stephen Mansour, University of Scranton

[2] Estimation of an Economic Indicator Using Computational Modeling Based on Historical Data
   Brian Chung, Stevenson School
   Richard Kyung, RISE Group in NJ

   Necati Tekatli, Kutztown University of Pennsylvania

Discussants:
[1] Brian Chung, Stevenson School
[2] Necati Tekatli, Kutztown University of Pennsylvania
[3] Stephen Mansour, University of Scranton

Session F1C: Economic Development, Innovation, Technological Change, and Growth
McFarland Student Union Building Room 157B (09:00 – 10:15 am)

Chair: Yaya Sissoko, Indiana University of Pennsylvania

[1] Exploitation, Exploration, Development, and Decay of Resources: A Systemic View
   Jeffrey Forrest, Slippery Rock University
   Yong Liu, Jiangnan University
   Eric Swift, Slippery Rock University
   Tooraj Karimi, University of Tehran

[2] Entrepreneurship in Mena Conflict and Post-Conflict States
   Frank Gunter, Lehigh University

   Robert Wright, Augustana University
Discussants:
[1] Frank Gunter, Lehigh University
[2] Robert Wright, Augustana University

Session F1D: Agricultural and Natural Resource Economics • Environmental and Ecological Economics
McFarland Student Union Building Room 312 (09:00 – 10:15 am)
Chair: Jui-Chi (Rocky) Huang, Penn State Berks

[1] Impact of Green Growth on the Sustainable Development of India
   Babita Srivastava, William Paterson University

[2] Commodities Spillover Effects in the United States
   Andrew Alola, Istanbul Gelisim University
   Uju Violet Alola, Istanbul Gelisim University

   Mehdi Hojjat, Neumann University

Discussants:
[1] Jeff Salavitabar, Delaware County Community College
[2] Jui-Chi (Rocky) Huang, Penn State Berks

Session F1E: Urban, Rural, Regional, Real Estate, and Transportation Economics
McFarland Student Union Building Room 322 (09:00 – 10:15 am)
Chair: Eric Malm, Cabrini University

[1] Recent Volatility in Oil and Gas Production on Employment Change in North Dakota: A Dynamic Analysis
   David Doorn, West Chester University

   Jeremy Sze, Hunter College, City University of New York

   Rhoda Joseph, Penn State-Harrisburg
   Sabri Yilmaz, Penn State-Harrisburg
[4] Dividend Housing: A Community-Based Affordable Housing Model
   Eric Malm, Cabrini University

Discussants:
[1] Jeremy Sze, Hunter College, City University of New York
[3] Eric Malm, Cabrini University
[4] David Doorn, West Chester University

Session F1F: Undergraduate Session
   Health, Education, and Welfare

   McFarland Student Union Building Room 323 (09:00 – 10:15 am)

   Chair: Stephanie Brewer, Indiana University of Pennsylvania

[1] The Impact of Civil Unrest on Baltimore Area Students Educational and Economic Outcomes
   Ryan Hor, Towson University
   Melissa Groves, Towson University

[2] The Effect of the Dependent Coverage Provision of the Affordable Care Act on Opioid Use and Abuse
   Christian Carrillo, Hunter College

[3] Effects of Connecticut Magnet Schools and Integration on Student Academic Achievement
   Caroline Accurso, DeSales University

   Roberto Recchia, DeSales University

Discussants:
[1] Christian Carrillo, Hunter College
[2] Caroline Accurso, DeSales University
[3] Roberto Recchia, DeSales University
[4] Ryan Hor, Towson University
Session FIG: Undergraduate Session  
Best Student Paper Contest

McFarland Student Union Building Room 324 (09:00 – 10:15 am)

Chair: Stephen Foreman, Robert Morris University

   Elena Pikounis, Lycoming College

   Timothy Caulfield, Gannon University

   Sierra Loehr, Clarion University

Session F2: Friday, May 31, 2019
10:30 – 11:45 am

F (Friday); F2 (Friday Concurrent 2); F2A (Friday Concurrent 2 Session A)

Session F2A: General Economics and Teaching
McFarland Student Union Building Room 116 (10:30 – 11:45 am)

Chair: Anusua Datta, Thomas Jefferson University

   Keshav Gupta, Kutztown University
   Mostafa Maksy, Kutztown University

   Nancy Fox, Saint Joseph's University

   Scott Trees, Siena College
[4] Fostering Learning by Doing through Undergraduate Research
   Anusua Datta, Thomas Jefferson University

Discussants:
[1] Nancy Fox, Saint Joseph's University
[2] Scott Trees, Siena College

Session F2B: Financial Economics
McFarland Student Union Building Room 157A (10:30 – 11:45 am)

Chair: John Ruddy, University of Scranton

[1] CEO Compensation and Misery Index
   Taek Kim, West Chester University
   Won Yong Kim, Augsburg University

[2] Post Bankruptcy Credit Experience of Student Loan Borrowers
   Onesime Epouhe, Federal Reserve Bank of Philadelphia
   William Hewitt, Federal Reserve Bank of Philadelphia

[3] Examining the Relationship Between Sovereign Bond Prices and Political Stability
   John Ruddy, University of Scranton
   Thomas Meehan, University of Scranton

Discussants:
[2] John Ruddy, University of Scranton
[3] Taek Kim, West Chester University
Session F2C: Health, Education, and Welfare
McFarland Student Union Building Room 157B (10:30 – 11:45 am)

Chair: Elsy Thomas K, BGSU

[1] The Demand for Cigarettes, Juul, and Other Vaping Products: Evidence from Experimental Auctions
  Matthew Rousu, Susquehanna University
  Victoria Lambert, University of South Carolina
  Bailey Hackenberry, Susquehanna University
  James Thrasher, University of South Carolina

[2] Economic Issues Preventing Good Healthcare
  CJ Rhoads, Kutztown University

[3] Obesity and Socioeconomic Status in Peruvian Women: Evidence of Panel Data Analysis
  Tahereh Alavi Hojjat, DeSales University
  Juan Daniel Morocho Ruiz, National Institute for the Defense of Competition and the Protection of Intellectual Property

  Elsy Thomas K, BGSU

Discussants:
[1] CJ Rhoads, Kutztown University
[2] Tahereh Alavi Hojjat, DeSales University

Session F2D: Business Administration and Business Economics • Marketing • Accounting • Personnel Economics
McFarland Student Union Building Room 312 (10:30 – 11:45 am)

Chair: Steven Andelin, Pennsylvania State University

  Diane Galbraith, Slippery Rock University
  Sunita Mondal, Slippery Rock University

  Qian “Emma” Hao, Kutztown University
  Liaoliao Li, Kutztown University
Robert Derstine, West Chester University  
James Emig, Villanova University  
James Borden, Villanova University

Steven Andelin, Pennsylvania State University

Discussants:  
[1] Qian “Emma” Hao, Kutztown University  
[2] Robert Derstine, West Chester University  
[3] Steven Andelin, Pennsylvania State University  

Session F2E: Undergraduate Session  
Economic Development, Innovation, Technological Change, and Growth

Mcfarland Student Union Building Room 322 (10:30 – 11:45 am)

Chair: James Jozefowicz, Indiana University of Pennsylvania

[1] Increasing Efficiency with Northwestern, PA Trade Partners by Identifying Comparative Advantage  
Hannah Carlino, Penn State University  
Travis Yates, Penn State University

Logan Cooper, Clarion University

[3] Income and Gender Inequality in America  
Austin Kroeger, DeSales University

Discussants:  
[1] Logan Cooper, Clarion University  
[2] Austin Kroeger, DeSales University  
[3] Hannah Carlino, Penn State University

Faculty Discussant: Elizabeth A. Moorhouse, Ph.D. Lycoming College
Session F2F: Public Economics
McFarland Student Union Building Room 323 (10:30 – 11:45 am)

Chair: Thomas Armstrong, Wilson College

[1] Does the Hayek-Friedman Hypothesis Apply to the Internet?
   Zachary Klingensmith, Penn State Erie, The Behrend College
   William McAndrew, Gannon University

   David Nugent

   Thomas Armstrong, Wilson College

Discussants:
[1] David Nugent
[3] Zachary Klingensmith, Penn State Erie, The Behrend College

Session F2G: Undergraduate Session
Best Student Paper Contest

McFarland Student Union Building Room 324 (10:30 – 11:45 am)

Chair: Divya Balasubramaniam, Saint Joseph’s University

[1] A Political and Economic Analysis of the U.S.-China Trade War
   Drake Jacobs Albright College
   Cody Stetson

   Chris Funge Muhlenberg College

[3] How Demographic and Economic Variables Affect the Female Labor Force Participation Rate
   Kaitlin Albright Indiana University of Pennsylvania
   Jesalyn N. Fada Indiana University of Pennsylvania
Keynote Speaker Luncheon

Friday, May 31, 2019
12:00 PM – 01:45 PM
Mcfarland Student Union Building, Room 218
Sponsored by the KU Foundation
Keynote Speaker

Friday, May 31, 2019
12:00 PM – 01:45 PM
McFarland Student Union Building, Room 218

“The Economics of Social Justice”

Dr. Frank R. Gunter
Professor of Economics, a Senior Fellow at the Foreign Policy Research Institute, and a retired U.S. Marine Colonel
Dr. Frank R. Gunter is a Professor of Economics, a Senior Fellow at the Foreign Policy Research Institute, and a retired U.S. Marine Colonel. After receiving his Doctorate in Political Economy from Johns Hopkins University in 1985, Frank joined the faculty of Lehigh University where he teaches Principles of Economics, Economic Development, Chinese Economic Development, and the Political Economy of Iraq. He has won four major and multiple minor awards for teaching excellence. Based on his two years in Iraq as an economic advisor to the US Government, Frank wrote *The Political Economy of Iraq: Restoring Balance in a Post-Conflict Society* (Edward Elgar Publishing, 2013). This book was published in both English and Arabic and was selected as an “Outstanding Academic Title” by *Choice* magazine. His most recent work, “Immunizing Iraq Against al Qaeda 3.0” (*Orbis*, 2018, Vol. 62, No. 3, pp. 389-408), discusses the possible economic causes of political instability in Iraq. Frank is married with three children, and his family shares their Pennsylvania home with over 4,000 books.
Session F3: Friday, May 31, 2019
2:15 – 3:30 pm

F (Friday); F3 (Friday Concurrent 3); F3A (Friday Concurrent 3 Session A)

Session F3A: International Economics
McFarland Student Union Building Room 116 (2:15 – 3:30 pm)

Chair: Xuebing Yang, Penn State Altoona

[1] Impact of EU’s Latest Reform of Generalized System of Preferences
   Mitali Pradhan, Fordham University

[2] The Importance of Distance in the Naturalization Decision
   Melissa Groves, Towson University
   Tamara Woroby, Towson University

[3] Value-Added Share and Elasticity of Trade to Barriers
   Xuebing Yang, Penn State Altoona

Discussants:
[1] Melissa Groves, Towson University
[2] Xuebing Yang, Penn State Altoona

Session F3B: Financial Economics
McFarland Student Union Building Room 157A (2:15 – 3:30 pm)

Chair: M. Garrett Roth, Gannon University

[1] A Deterministic Genetic Algorithm and Its Implications for the Efficient Market Hypothesis
   Daniel Svogun, Fordham University

[2] An Increase in Federal Minimum Wage- Good for Employees, Bad for Stockholders?
   Carolyne Soper, Central Connecticut State University
   Monika Sywak, Caldwell University

   M. Halim Dalgın, Kutztown University
   Keshav Gupta, Kutztown University
   M. Garrett Roth, Gannon University

Discussants:
[1] Carolyne Soper, Central Connecticut State University

Session F3C: Labor and Demographic Economics
McFarland Student Union Building Room 157B (2:15 – 3:30 pm)

Chair: Jeff Salavitabar, Delaware County Community College

[1] Intergenerational Mobility in Income: Evidence from Indonesia
   Rafia Zafar, Fordham University

[2] Impact of Terrorism on Child Sex at Birth: A Case of Pakistan
   Javed Younas, American University of Sharjah
   Khusrav Gaibulloev, American University of Sharjah
   Gerel Oyun, Independent scholar

   Shuhua He, SUNY at Buffalo

   Sunita Mondal, Slippery Rock University of Pennsylvania
   Frederick Tannery, Slippery Rock University of Pennsylvania

Discussants:
[1] Javed Younas, American University of Sharjah
[2] Shuhua He, SUNY at Buffalo
Session F3D: Business Administration and Business Economics •
Marketing • Accounting • Personnel Economics
McFarland Student Union Building Room 312 (2:15 – 3:30 pm)

Chair: Orhan Kara, West Chester University

[1] An Examination of the Acceptance of Artificial Intelligence: Exploring Smart
Speaker Adoption with the Unified Theory of Acceptance and Use of Technology
(UTAUT)
  Gary Bennett, Widener University
  Donna McCloskey, Widener University

[2] Will Accounting Standards Update 2014-09 Enhance the Comparability of
Unexercised Contractual Rights?
  Gregory Kaufinger, Kutztown University

  Orhan Kara, West Chester University

Discussants:
[1] Gregory Kaufinger, Kutztown University
[2] Orhan Kara, West Chester University

Session F3E: Economic Development, Innovation, Technological
Change, and Growth
McFarland Student Union Building Room 322 (2:15 – 3:30 pm)

Chair: Farhad Saboori, Albright College

  Armando Rodriguez, University of New Haven
  Brian Kench, College of Business/University of New Haven

[2] Innovation and the Business Environment
  Carlos Liard, Central Connecticut State University
  Carolyne Soper, Central Connecticut State University

[3] The Relative Importance of Economic and Institutional Factors Contribution to
Economic Growth: An Empirical Analysis
  Farhad Saboori, Albright College
  Gertrude Eguae-Obazee, Albright College
Discussants:
[1] Carlos Liard, Central Connecticut State University
[2] Farhad Saboori, Albright College

Session F3F: Economic Development, Innovation, Technological Change, and Growth
McFarland Student Union Building Room 323 (2:15 – 3:30 pm)
Chair: Brian Sloboda, University of Phoenix

[1] Economic Growth, Competitiveness and Well-Being in Italy
   Sandra Trejos, Clarion University of Pennsylvania

   Raymond Maynard, Franklin & Marshall College
   Abhishek Anand, Franklin & Marshall College

   Brian Sloboda, University of Phoenix
   Yaya Sissoko, Indiana University of Pennsylvania
   Kalamogo Coulibaly, Overseas Private Investment Corporation

Discussants:
[2] Brian Sloboda, University of Phoenix
[3] Sandra Trejos, Clarion University of Pennsylvania
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Federal Reserve Lecture
Friday, May 31, 2019
03:45 PM – 04:45 PM
McFarland Student Union Building, Room 183

“Economic Update”

Ryotaro Tashiro
Economic and Public Outreach Associate of the Federal Reserve Bank of Philadelphia
Ryotaro Tashiro is a regional economic advisor in the Research Department of the Federal Reserve Bank of Philadelphia. He is responsible for conducting research on current regional economic issues in the Federal Reserve’s Third District and informing external audiences on national and regional economic conditions, monetary policy, and the role of the Federal Reserve in the economy.

Prior to joining the Bank in June 2016, Tashiro was a business analyst for Bloomberg, where he was responsible for conducting research on issues related to equity data quality. He also has substantial teaching experience, ranging from high school advanced placement economics to undergraduate intermediate Japanese and intermediate Spanish.

Tashiro has a master’s degree in economics from the University of Michigan–Ann Arbor and a bachelor’s degree in economics from Kenyon College.
Federal Reserve Reception
Friday, May 31, 2019
05:00 PM – 08:00 PM
McFarland Student Union Building, Room 223
SATURDAY, June 1, 2019

Conference Registration – McFarland Student Union Building
Lobby, outside of Room 218
07:30 AM – 10:30 AM

Pearson Continental Breakfast – McFarland Student Union
Building, Room 250
07:30 AM – 9:00 AM

Session S1: Saturday, June 1, 2019
09:00 – 10:15 am

S (Saturday); S1 (Saturday Concurrent 1); S1A (Saturday Concurrent 1 Session A)

Session S1A: Macroeconomics and Monetary Economics
McFarland Student Union Building Room 116 (09:00 – 10:15 am)

Chair: Suvayan De, University of Charleston

[1] Sectoral Effects of Unconventional Monetary Policy under Zlb and Its Cross-Country Implications
   Eiji Goto, The George Washington University

[2] Forecasting GDP and Unemployment in Berks County, PA
   Abdulwahab Sraiheen, Kutztown University
   M. Halim Dalgin, Kutztown University
[3] Firms’ Credit Requirements and Monetary Policies
   Anurud Rankoth Gedara, Texas Tech University
   Niraj Koirala, Texas Tech University

[4] Patriotism and Immigration in an Economy
   Suvayan De, University of Charleston

Discussants:
[1] Abdulwahab Sraiheen, Kutztown University
[3] Suvayan De, University of Charleston

Session S1B: Health, Education, and Welfare
McFarland Student Union Building Room 157A (09:00 – 10:15 am)

Chair: Anusua Datta, Thomas Jefferson University

[1] Income Inequality and Clinical Outcomes: An Empirical Study on Cardiovascular Incidence
   I-Ming Chiu, Rutgers University Camden

   Mehdi Khalighi, Millersville University

   Anusua Datta, Thomas Jefferson University

Discussants:
[1] Mehdi Khalighi, Millersville University
[3] I-Ming Chiu, Rutgers University Camden
Session S1C: Business Administration and Business Economics • Marketing • Accounting • Personnel Economics
MCFarland Student Union Building Room 157B (09:00 – 10:15 am)

Chair: Joseph Cunningham, Wilson College

[1] What Motivates Students to Take the CPA Exam?
   Brian Trout, Millersville University
   Eric Blazer, Millersville University

   Qin Geng, Kutztown University of Pennsylvania
   Nicholas Petruzzi, Penn State University at College Park

   Jeffrey Forrest, Slippery Rock University
   Yong Liu, Jiangnan University
   Jesus Valencia, Slippery Rock University
   Yaya Sissoko, Indiana University of Pennsylvania

[4] The Variability of Cost in Obtaining an Accounting Degree in Pennsylvania
   Joseph Cunningham, Wilson College

Discussants:
[1] Qin Geng, Kutztown University of Pennsylvania
[4] Brian Trout, Millersville University
Session S1D: Urban, Rural, Regional, Real Estate, and Transportation Economics
Mcfarland Student Union Building Room 312 (09:00 – 10:15 am)

Chair: Malek Lashgari, University of Hartford

[1] The Invisible Costs of Promoting Competition in the Airline Industry
   Hoang Dao, SUNY Buffalo

[2] The Validity of Consumer Sentiment in Small-Area Economic Forecasting
   Armando Rodriguez, University of New Haven
   Carolyne Soper, Central Connecticut State University

[3] Analysis of Yield in Real Estate
   Malek Lashgari, University of Hartford
   Johannes Schmermund, University of Hartford

   Ismail Ait Saadi, Swinburne University of Technology

Discussants:
[1] Armando Rodriguez, University of New Haven
[2] Malek Lashgari, University of Hartford
[3] Hoang Dao, SUNY Buffalo

Session S1E: Labor and Demographic Economics
Mcfarland Student Union Building Room 322 (09:00 – 10:15 am)

Chair: Tom Tolin, West Chester University

[1] Life-Cycle Approach to Informal Work in Europe
   Valentinias Rudys, Fordham University

[2] The Demographics of Income Inequality: The Role of Education and Age
   Lisa Wilder, Albright College

   Justine Herve, Fordham University

[4] Horizontal Equity in Public Schools: The Pennsylvania Study
   Tom Tolin, West Chester University
Discussants:
[1] Lisa Wilder, Albright College
[3] Tom Tolin, West Chester University

Session S1F: Other Special Topics
McFarland Student Union Building Room 323 (09:00 – 10:15 am)

Chair: Michael McAvoy, SUNY Oneonta

[1] From Gown to Town: The Economic Transformation of the University of Pennsylvania
   Helen Midouhas, Alvernia University

[2] The Continued Progression of Sweden’s Sustainable (Green) Economy
   Timothy Wilson, Umeå School of Business, Economics, and Statistics
   Lars Lindbergh, Umeå School of Business, Economics, and Statistics

[3] Intelligence, Religiosity, and Environmental Emissions
   Jay Squalli, American University of Sharjah

   Michael McAvoy, SUNY Oneonta
   Kpoti Kitissou, SUNY Oneonta
   Nicholas Giordano, SUNY Oneonta

Discussants:
[2] Jay Squalli, American University of Sharjah
[4] Helen Midouhas, Alvernia University
Session S1G: Undergraduate Session
International Economics

McFarland Student Union Building Room 324 (09:00 – 10:15 am)

Chair: Tufan Tiglioglu, Alvernia University

   Imad El Hamma, University of Paris Est Marne La Vallée
   Farid Echcharfi, Mohammed V University Rabat Morocco

   Krista Mosi, Clarion University

   Zheng Jia, The Harker School
   Elle Pak, Yale University

Discussants:
[3] Imad El Hamma, University of Paris-Est Marne-la-Vallée
General Membership Meeting

Saturday, June 1, 2019
10:30 AM – 11:45 AM

McFarland Student Union Building, Room 183

Our Annual Business Meeting of the General Membership of the Pennsylvania Economic Association is open to the entire membership of the PEA, including all registrants of the conference.

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² Morning Consult, on behalf of Cengage, conducted a national survey from July 11-13, 2018, among a national sample of 1,651 current and former students, ages 16 to 32. The interviews were conducted online and the data were weighted to approximate a target. Results from the full survey have a margin of error of plus or minus 2 percentage points.
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NOTE

Are my expectations rational?

You're the most robust model I've seen in a while.
Being your prisoner is no dilemma.

My interest in you has compounded continuously.

Source of jokes: https://economicscience.net/content/JokEc/
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CONNECITCUT MAGNET SCHOOLS, INTEGRATION, AND ACADEMIC ACHIEVEMENT

Caroline Accurso
DeSales University

ABSTRACT

In this paper, we explore the relation between magnet school attendance, integrated school attendance, and Connecticut students’ standardized test scores (Smarter Balanced Assessments), using public data from 2014 to 2018. We incorporate various controls and explore separately the achievement of students from various demographic backgrounds. In particular, we find that a school’s integration status and its magnet status are both individually positively correlated with greater percentages of minority students performing at grade-level on standardized tests. The combination of these factors, however, i.e. both achieving integration and being a magnet school, did not have a statistically significant relationship with achievement of minority students.

INTRODUCTION AND BACKGROUND

In 1996, the Connecticut Supreme Court ruled in Sheff v. O’Neill that severe racial and economic isolation among students in the public schools of Hartford, Connecticut, about 90% of whom are black or Hispanic, violated their constitutional rights to an adequate education. As a result of this ruling, many magnet schools were established in the Hartford region that aimed to attract students both from Hartford as well as from the surrounding suburbs where most students are white, thus achieving integration. A school is considered integrated if no more than 75% of its students are black or Hispanic, and acceptance to magnet programs is based on a lottery application process. Because the magnet schools are of much better quality than Hartford’s non-magnet public schools but still generally of poorer quality than suburban schools, demand for a magnet education is higher among Hartford residents than among suburban residents, and some magnet schools have difficulty attracting white and Asian students. These magnet schools then seem reluctant to accept additional minority students from their waitlists after the initial lottery selection because they may lose their “integrated” status (Rabe Thomas 2018). In February 2018, a lawsuit named Robinson v. Wentzell was filed challenging the lottery application system and integration “quotas” of the Hartford magnet school system as discriminatory towards black and Hispanic students. It was determined in March 2019 that this case would be settled in federal court (Megan 2019). In February 2019, another lawsuit, Connecticut Parents’ Union v. Wentzell, was filed challenging a law that required all magnet schools throughout Connecticut to adhere to Hartford’s integration standards. In this paper, we investigate whether attendance at magnet schools has a demonstrable relationship with the performance of Connecticut students in contrast to their peers at traditional public schools. In particular, we investigate whether the level of integration of the school, in addition to schools’ magnet status or lack thereof,
associated with differing levels of achievement among students of minority racial/ethnic backgrounds.

REVIEW OF LITERATURE

Several previous studies similar to the one we are undertaking have been carried out in the past. The 2018 study “Income Segregation between School Districts and Inequality in Students’ Achievement” by Ann Owens investigates the relationship between income segregation between school districts nationwide and the achievement gaps between black and white students in these districts. Using an ordinary least squares regression approach, she found that greater income segregation between districts located in the same metropolitan statistical area has a statistically significant association with greater gaps between the achievements of black and white students in these districts in both mathematics and reading (Owens 2018).

A similar nationwide study on the relationship between racial segregation and achievement gaps between black and white students was performed by the National Center for Education Statistics (NCES), based on data from the National Assessment of Educational Progress (NAEP). This study found that higher levels of black student density within a school are associated with a statistically significant decline in the academic achievement levels of both black and white students (NCES 2015). The study did not, however, find that the black-white achievement gap present in schools with high black student density significantly differs from the black-white achievement gap present in schools of lower black student density (NCES 2015).

Besides these nationwide studies, several studies have particularly focused on education in Connecticut. The CT Mirror, for example, has done a large amount of investigation into Connecticut magnet schools and students’ achievement there. While they did not perform any advanced statistical analysis, they compared the outcomes of magnet and non-magnet students. They found that in 2017-2018, a mere 20% of low-income students in Hartford’s traditional public schools performed at grade level and 56% were multiple grade levels behind on Connecticut’s English exam. In contrast, 35% of low-income students who attended magnet schools operated by Connecticut’s Capitol Region Education Council (CREC) performed at grade level and only 38% were multiple grade levels behind (Rabe Thomas 2018). Although the CT Mirror did not test for statistical significance, their finding suggests a strong positive relationship between attendance at magnet schools and better academic performance among low-income students in the Hartford region.

Possibly the most rigorous study to have been done so far on the subject was the result of a commission from the Connecticut State Department of Education: “Evaluating the Academic Performance of Choice Programs in Connecticut: A Pretest-Posttest Evaluation Using Matched Multiple Quasi-Control Comparison Groups”. This study followed students from 2010 to 2012 to determine whether attendance at magnet schools and other choice programs might be associated with closing the achievement gap on the standardized Connecticut Mastery Test (CMT) between urban students and their non-urban peers. They found that magnet schools operated by Regional Education Service Centers (RESCs) were most successful in closing achievement gaps between urban and non-urban students in grades 3-5. Between grades 6-8, however, the study found that public charter school attendance was associated with the strongest proficiency gains (Mooney 2015).
Our research differs from the studies we have described above in several important ways. First, in contrast to the two studies mentioned first, our research will specifically focus on Connecticut. In addition, whereas the CT Mirror’s study focused on low-income students in the Hartford region, we will focus on students from across the state and from various demographic groups. Moreover, we will explicitly investigate certain relationships that the CT State Department of Education’s research did not focus on, such as the level of integration in Connecticut schools and whether this might be correlated with some of the positive achievement gains by students in magnet schools.

DATA AND METHODOLOGY

The data used in our research is publically available, found on the Connecticut State Department of Education’s website (Edsight). We used data on the achievement of students in grades 3, 4, 5, 6, 7, 8, and 11 in the school years between 2014 and 2018 on Connecticut’s recently adopted standardized tests, the Smarter Balanced assessments in English language arts (ELA) and mathematics. (Data from Grade 11 was only available for the 2014-2015 school year.) Data on the number and demographics of teachers comes from EdSight as well. Data on student demographics, school location, and magnet school status comes from NCES’s Common Core of Data for the 2014-2017 school years and from EdSight for the 2017-2018 school year. For the sake of consistency, if a school were reported with magnet status in any of the school years 2014-2018, it was counted as a magnet school for all four years. (After the 2014-2015 school year, magnet schools drawing students from only one district were no longer officially reported as having magnet status.) Percent of students at various levels of standard achievement (Level 1 = “Not Met”, Level 2 = “Approaching”, Level 3 = “Met”, and Level 4 = “Exceeded”) was reported by year, grade, school, and race/ethnicity. Thus, in the tables of summary statistics, the horizontal titles represent races/ethnicities for which achievement data was obtained and the achievement level percentages represent the average achievement of members of these races/ethnicities for all schools, grades, and years in which data was obtained. The race/ethnicity and free/reduced-price lunch eligibility percentages reported represent the average student demographic makeup of their schools.

It ought to be noted that much data was censored for privacy reasons. Edsight does not display count values less than 5. Additionally, if that rule caused the censure of just one value in a set, the system censors the second-lowest count value in that set as well. Thus, for example, if 2 students in a grade were in the Level 1 percentile, 7 in Level 2, 12 in Level 3, and 15 in Level 4, the system would only display the values for Levels 3 and 4. The value for Level 1 would have been censored because it was below 5, while the value for Level 2, as the second-lowest value, would also have been censored in order that the Level 1 value could not be calculated (since the data would also contain the total number of students in the grade). For this reason, there is not much data about the performance of black and Hispanic students in schools where they form a small minority of their grades, potentially causing biased estimations.

All analysis was performed in Stata SE 15.1. To model our data, we had to choose whether to use a pooled Ordinary Least Squares (OLS) model, a fixed-effects model, or a random-effects model. We defined Grade as our panel variable and performed the Breusch-Pagan Lagrange multiplier (LM) test for random effects on the model.
\[
\text{MetStandard}_{\text{Grade},j} = \beta_1 \text{BlackHispanicStudents}_{\text{Grade},j} + \beta_2 \text{FRPLEligible}_{\text{Grade},j} \\
+ \beta_3 \text{Magnet}_{\text{Grade},j} + \beta_4 \text{StudentsPerTeacher}_{\text{Grade},j} + \beta_5 \text{Suburb}_{\text{Grade},j} \\
+ \beta_6 \text{Rural}_{\text{Grade},j} + \beta_7 \text{BlackHispanicStaff}_{\text{Grade},j} + \alpha + u_{\text{Grade},j} + \epsilon_{\text{Grade},j}
\]

where \text{MetStandard} was the percent of students who attained Levels 3 or 4, \text{BlackHispanicStudents} was the total percentage of black and Hispanic students in a school, \text{FRPLEligible} was the total percentage of students eligible for free or reduced-price lunch programs (FRPL), \text{Magnet} was a dummy variable equal to 1 for magnet schools and 0 otherwise, \text{StudentsPerTeacher} represented the student-teacher ratio, \text{Suburb} and \text{Rural} were dummy variables indicating the school’s location (as opposed to within a city), \text{BlackHispanicStaff} was the total percentage of black and Hispanic staff in a school, \(u\) was the between-grades error, \(\epsilon\) was the within-grades error, and \(j\) represented a particular student-group within the grade. Since the \(p\)-value for the Breusch-Pagan LM test was greater than 0.05 in all cases (see Table 1), we failed to reject the null hypothesis that errors were not correlated with the independent variable. We thus used a pooled OLS model rather than a fixed-effects or a random-effects model.

RESULTS

\textit{English Language Arts}

Running an ordinary least squares (OLS) regression model with robust standard errors, the percentage of students of black and Hispanic race/ethnicity was not shown to have a statistically significant correlation with the achievement of black / African-American students when this was the only independent variable (regression 1 in Table 6). However, magnet status alone was significant at the 5% confidence level (regression 2). When these were considered together, both coefficients were slightly larger and again, only the school’s magnet status was statistically significant at the 5% confidence level (regression 3). When another dummy variable, \text{MeetsIntegStandard}, was introduced that indicated whether the school met integration standards (no more than 75% of the student body black or Hispanic), its regression coefficient was shown to be statistically significant at the 1% confidence level (regression 4). The results changed significantly when a third dummy variable, \text{MagnetIntegration}, was introduced that tested whether a school both had magnet status and was meeting integration standards. This variable was not statistically significant, but its inclusion resulted in much higher coefficient values for the variables indicating a school’s magnet status and whether or not it met the integration standard (regression 5). Controls for the percentage of students in the school who were eligible for free or reduced-price lunch, the school’s location, the student-teacher ratio, and the percentage of staff of black or Hispanic race/ethnicity were included for all regressions. The results seem to indicate that for black students, attendance at either a magnet school or an integrated school was associated with higher ELA achievement, without it being necessary for a magnet school to meet the integration standard. However, it is very important to realize that all of these regressions had very low \(R^2\) values, indicating that there are many other variables that could not be controlled for that likely had a great impact on African-American students’ ELA achievement levels in different school environments.
For Hispanic / Latino students, in contrast to black students, both the percentage of black and Hispanic students in their schools and whether the school had magnet status were shown individually to have statistically significant associations at the 1% confidence level with the number of Hispanic students who performed at or above grade level (regressions 1 and 2 in Table 7). A school’s magnet status was shown to have a stronger relationship with achievement than the school’s racial/ethnic composition, but the $R^2$ value was slightly lower for this regression (2) than in regression 1. When these two variables were considered together, both regression coefficients were shown to be statistically significant at the 1% level, with a school’s magnet status again shown to have a much greater association than racial/ethnic composition (regression 3). When whether a school met Connecticut’s integration standard was tested rather than the percentage of students who were black or Hispanic, both this factor and magnet status had statistical significance at the 1% level (regression 4). When the MagnetIntegration dummy variable was included in the regression, however, this interaction was not found to be statistically significant (regression 5). Rather, the school’s magnet status and whether the school met the integration standard were both statistically significant at least at the 5% level and had slightly higher values than in regression 4. All of these regressions had $R^2$ values of at least 0.39, and all included various controls.

**Mathematics**

As when we investigated ELA achievement, we investigated mathematics achievement with an ordinary least squares (OLS) regression model, taking into account robust standard errors. With this model, the percentage of students of black and Hispanic race/ethnicity was not shown to have a statistically significant correlation with the percentage of African-American students at a school who met or exceeded the standard in math (regression 1 in Table 8). However, the school’s magnet status alone did have a statistically significant relation with the mathematics achievement of black / African-American students (regression 2). When both of these factors were considered together, only the magnet status variable was statistically significant at the 5% confidence-level (regression 3). When another dummy variable, MeetsIntegStandard, was introduced that indicated whether the school met integration standards, its coefficient was shown to be statistically significant at the 1% confidence level (regression 4). This variable’s coefficient was slightly higher when a third dummy variable, MagnetIntegration, was introduced that tested whether a school both had magnet status and was meeting integration standards (regression 5). This dummy variable was not statistically significant, but the coefficients on the variables independently testing for a school’s magnet status and integration status were both statistically significant at the 1% confidence level. These results seem to indicate that for black students, both integrated schools and magnet schools are associated with higher achievement, but the presence of both together may not be as significant. All regressions incorporated various controls but still suffered from low $R^2$ values. This suggests that there are many other variables that were not controlled for and likely had a much greater impact on the mathematics achievement levels of African-American students in different school environments.

For Hispanic / Latino students, as with black students, only whether the school had magnet status, not the percentage of students of black or Hispanic ethnicity, was shown individually to have statistical significance at the 1% confidence level (regressions 1 and 2 in Table 9). When a school’s magnet status and its percentage of black or Hispanic
students were considered together, again only the school’s magnet status was shown to be statistically significant at the 1% confidence level (regression 3). Next, when whether a school met Connecticut’s integration standard was tested rather than the percentage of students who were black or Hispanic, both regression coefficients had statistical significance at the 1% level (regression 4). When the MagnetIntegration dummy variable was included in the regression, however, this interaction was not found to be statistically significant (regression 5). Rather, whether the school’s magnet status and whether it met the integration standard were both significantly significant at the 1% level and had higher values than in regression 4. All regressions included various controls. It is important to note, however, that all of these regressions also had $R^2$ values of less than 0.28.

**DISCUSSION**

The results gained from this study have many different implications, although they only indicate correlation and do not necessarily imply causation. First, they show that for black / African-American students, since $R^2$ values were always quite small, attendance at magnet schools and/or attendance at integrated schools may not be the factors that account for the greatest variation in their achievement in either ELA or mathematics. Future studies might improve upon the results of this study by incorporating more controls and investigating the potential impact of other factors. These factors might include the amount of funding that schools receive and what that money is used for, as well as parents’ education levels and involvement in their children’s education. Unfortunately, these factors were beyond the scope of this paper. Several other controls were, however, included in this paper, including the percentage of students in a school who were eligible for free or reduced-price lunch as a measure of the economic well-being of a school’s community as well as the percentage of a school’s educators who were of African-American or Hispanic race / ethnicity. (It was thought that the presence of role models from minority racial / ethnic backgrounds might have a positive influence on the achievement of students of minority racial / ethnic backgrounds).

For Hispanic / Latino students, attendance at magnet schools and attendance at integrated schools appeared to account for much more of the variance in ELA achievement levels than in mathematics achievement levels. Additionally, these factors were generally more closely associated with ELA achievement than with mathematics achievement. It is not clear why this might be so. Nevertheless, the regressions also showed that for both ELA and mathematics, whether a school met Connecticut’s integration standard had a slightly greater correlation with the achievement of Hispanic students than did the school’s magnet status, even controlling for whether a school was located in a city, suburb, or rural area. It would be interesting to investigate this result further by including more controls, such as the amount of funding each school receives and what this money is used for, since these factors vary widely between districts.

Another important note is that magnet schools have various specialty areas. While many focus on improving achievement in science, technology, engineering, and mathematics (STEM), others are oriented towards performing or visual arts or other fields where standardized test scores may not be a main priority. For this reason, perhaps further studies ought to investigate black and Hispanic magnet student achievement taking into account the main academic focus area(s) of these schools. Teacher quality is another important factor
that likely accounts for much variation in students’ achievement levels but which we were unable to include in our regression analysis.

Unfortunately, it is likely that our results contain additional error due to missing data for situations in which there were only a few students falling into various achievement categories and/or various racial/ethnic groups. Perhaps having full access to the data could have provided more accurate results. In addition, self-selection bias may be present because in order to attend a magnet school, a student or the student’s parent/guardian must decide to fill out an application. There are various factors which could result in the neediest students being less likely to enroll in magnet schools, such as parent/guardian concerns over support for English language learners or students with specific disabilities. Moreover, magnet schools often are farther away than the neighborhood schools that students would normally attend otherwise, and families without a car might choose not to try to enroll their students in magnet schools due to difficulty reaching their children if there were ever an emergency at the school.

In conclusion, this study seems to indicate that both whether a school met Connecticut’s integration standard and whether a school had magnet status were positively and statistically significantly associated with the ELA and mathematics achievement of African-American and Hispanic / Latino students. Whether the school met Connecticut’s integration standard was slightly more strongly correlated with the academic achievement of black and Hispanic students than magnet status was. However, accurate conclusions from the regression results about the achievement of African-American students in both ELA and mathematics and the mathematics achievement of Hispanic students cannot be drawn because of the low $R^2$ values of these regressions. Further analysis must be done with more control variables included to draw more accurate and representative results.

REFERENCES


**TABLES AND FIGURES**

**Table 1: Breusch-Pagan Tests – MetStandard[Grade, t] = Xb + u[Grade] + e[Grade, t]**

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**Table 2: Summary Statistics – English Language Arts, Non-Magnet Schools**

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Table 3: Summary Statistics – English Language Arts, Magnet Schools

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Table 7: Hispanic / Latino students, ELA achievement

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Table 9: Hispanic / Latino students, mathematics achievement

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<td>(1.227)</td>
<td>(1.230)</td>
</tr>
<tr>
<td>Constant</td>
<td>35.73***</td>
<td>34.31***</td>
<td>34.36***</td>
<td>28.72***</td>
<td>28.59***</td>
</tr>
<tr>
<td></td>
<td>(1.512)</td>
<td>(1.521)</td>
<td>(1.518)</td>
<td>(2.007)</td>
<td>(2.006)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.246</td>
<td>0.263</td>
<td>0.258</td>
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</tr>
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</table>
HOW DEMOGRAPHIC AND ECONOMIC VARIABLES AFFECT THE FEMALE LABOR FORCE PARTICIPATION RATE

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We would like to thank our Introduction to Econometrics and Advanced Econometrics classes and classmates at the Indiana University of Pennsylvania for their support and comments throughout this semester. We especially are indebted to Dr. James Jozefowicz whose recommendations and editorial assistance significantly improved this paper.

ABSTRACT

The present study analyzes the labor force participation rate of women in the United States. Demographic, economic, educational, and family variables are examined using a balanced panel of the 50 states and the District of Columbia with annual data from 2000 to 2010 to determine the significant variables that impact the labor force participation rate of women. This study considers regressors that were suggested to be significant in previous studies as well as others not previously investigated, most notably the old-age dependency ratio. Data was collected from the U.S. Census Bureau, Federal Reserve Economic Data, and the U.S. Bureau of Labor Statistics. In accordance with the Hausman specification test, a two-way fixed effects model is utilized in this study to control for unobserved heterogeneity. F-tests are used to determine joint significance for the educational, race, and marital status variable groups. Throughout multiple models, the old-age dependency ratio is found to be consistently significant and negative. Other covariates that have a statistically significant impact on the female labor force participation rate include household income and the percent of the population with only a high school diploma.

INTRODUCTION

Background

In the past century, the aggregate labor force participation rate (LFPR) of women in the United States (US) has been rapidly increasing. During this time, society has had a drastic impact on whether women are permitted to enter the labor force or not. On the surface, the causes of such a large increase in the labor force participation among women seem obvious, such as the social normalization of females pursuing secondary education and the social normalization of women working outside the home. However, the increasing national LFPR
of women has been a more obvious point of observation for economists than the state-level LFPR of women. When considering state-level data, the LFPR fluctuates less severely than the aggregate rate. Between 2000 and 2008 the female LFPR in every state consistently increased. Then the rate fell in every state by at least one percentage point in 2009 following the Great Recession before increasing again in 2010. Conversely, the LFPR of men slowly has been decreasing during this same period.

The fluctuation in the LFPRs of men and women could be due to several factors. One example is the amendment to the Social Security Act which allowed individuals under 50 years of age to qualify for disability payments. Additionally, the Family and Medical Leave Act (FMLA) allows employees to take unpaid job-protected leave for various family and medical reasons with the continuous coverage of group health insurance. This act also permits 12 weeks of leave for employees as a result of the birth of a child, adoption or foster care, and serious health conditions (Blau & Kahn, 2013).

Many variables have contributed to the rising LFPR of women over the years. The most obvious and dramatic reason is the rise in the level of education women are now receiving. The time period of this study will not show a substantial increase in female education, but historically, the latter part of the 20th century was a period of significant increases in women’s education. Additionally, during this period, more women had begun to attend and graduate from a university or college instead of stopping their education at a high-school level. However, there are some factors that have negatively affected the LFPR of women. More recently, these include the number of children in the household and being married to a working spouse.

A novel variable in this study is the old-age dependency ratio, which compares the number of older dependents who are age 65 and over to the workforce who are between the ages of 15 to 64. In the US, the average life expectancy has been consistently increasing, which can be credited to medical advancements, socioeconomic status, and health behaviors. In 1965, the average life expectancy was 70 years old and it had increased to 79 years in 2017. With this increase in life expectancy comes a larger elderly population that requires care. Historically, women have been responsible for providing childcare for the household while the husband works. Over time, elderly care is becoming more necessary, and women are now taking on the role of caregiver for aging parents as well. As a result, a “sandwich generation” is being created of people who are responsible for the care of their own children and their aging parents.

Research Motivation and Significance

Despite the plethora of research regarding the comparison between male and female LFPRs, a dearth of research to assess the effect of the old-age dependency ratio on the LFPR of women exists. Sanchez and Kim (2018) were among the first to introduce the old-age dependency ratio as a way to measure the aging population. The old-age dependency ratio seems relevant when analyzing the female LFPR. The old-age dependency ratio increased 50 percent between 1960 and 2016, which also follows the aforementioned trend of life expectancy increasing by nine years during this same time period (Sanchez & Kim, 2018). This suggests that the variable could have a significant impact on a variety of dependent variables, including the female LFPR observed in this study. If findings indicate a statistically significant relationship between the LFPR of women and the old-age dependency
ratio, this could potentially reveal a new policy lever with respect to female labor force participation.

Outline of Paper

This paper attempts to determine the factors that play significant roles in explaining the increasing LFPR of women in each of the 50 states and the District of Columbia between 2000 and 2010. The second section of the paper reviews previous literature that explores various determinants affecting the LFPR of women. In the third section, the data, variables, hypotheses, and descriptive statistics are discussed. The econometric models and procedures used in the study are examined further in the fourth section. The fifth section presents regression results and interpretations of the analysis, as well as, a comparison of the study’s results to existing literature. Finally, conclusions are discussed in the last section of the paper.

LITERATURE REVIEW

Empirical Studies

In recent years, many economists have written about the increasing LFPR of women in the US, and they have explored some of the explanatory variables that may have contributed to this rise. The literature can be categorized based on the types of variables being analyzed, including demographic, economic, education, and family determinants. Each of the following studies examined one or more of these categories.

A study by Cebula and Coombs (2008) analyzed state-level data to identify some key factors that explain recent trends in the LFPR of women. This study gathered data from all 50 states, excluding the District of Columbia, for 2003. However, the explanatory variables were lagged to analyze the potential effects on the LFPR of women in 2004 and to mitigate concern of simultaneity bias. Cebula and Coombs (2008) considered numerous variables including the female unemployment rate, admitted immigrants as a percent of a state’s population, a state’s public assistance benefit programs, percent of female college graduates, and female median earnings, in addition to others. After these variables were analyzed in four models with various combinations of the regressors, all 11 variables in the study were found to be significant at the 1% level. Cebula and Coombs (2008) specifically found strong evidence that the LFPR of women is positively impacted by greater education, being married with a present spouse, expected earnings, experience, and welfare assistance.

Falzone (2017) investigated the aggregate LFPR and found that one key independent variable was educational attainment. It was observed that young adults with less than a high school education were the least likely segment of the population to participate in the labor market. Szulga (2014) examined the aggregate LFPR and found the ratio of men’s education to women’s education is gradually approaching one as time advances, which Cebula and Coombs (2008) also concluded in their state-level analysis. The improved educational attainment of women from generation to generation is believed to have contributed to the rise in the LFPR of women over the last few decades (Brusentsev, 2006).

Another article by Blau and Kahn (2013) looked at the LFPR of women in the US compared to other Organization of Economic Co-operation and Development (OECD) countries. In 1990, the US had the sixth highest female LFPR among the 22 OECD countries. However, over the years it has fallen to number 17 as of 2010. There are many policy
differences that exist between the US and the other OECD countries. In 1993, the US passed the FMLA, which allowed up to 12 weeks of unpaid leave for employees and represented a step forward for the US in trying to catch up to other countries. However, entitlements in other countries started earlier than 1993, and they typically are longer and paid. Public childcare is another area where the US is falling behind. Blau and Kahn (2013) explained that in 1990 the US spent 0.03 percent of GDP on childcare and it rose to 0.11 percent in 2007. For non-US countries, it started at about 0.35 percent of GDP in 1990 and rose to 0.47 percent in 2007. Childcare availability was expected to increase the LFPR of women because it reduces the cost of working outside the home.

Brusentsev (2006) analyzed numerous covariates every six years between 1967 and 2003 across the 50 US states. The study focused on the LFPR of women who were married or unmarried and who either had or did not have children. With these variables, six family-status categories were created: never married with no children, married with no children, other marital status with no children, never married with children, married with children, and other marital status with children. While conducting research, Brusentsev (2006) discovered an inverted U-shaped curve that was present in the estimates for married women with children and other-marital-status women with children relative to a reference group. Over the years, a changing relationship between marital status and the likelihood of labor market participation has been observed. Similarly, a study by Quinlan and Shackleford (1980) found that the percent of women who were married also significantly affected the LFPR of women.

Juhn and Potter (2006) looked at the changes in the labor force participation in the US. Specifically, the aggregate LFPR had increased over the past two-and-a-half decades, starting in the mid-1960s. However, since the 1990s, it had reached its maximum and decreased thereafter. Female LFPR also has followed this trend. Juhn and Potter (2006) looked at the LFPR of women in four distinct categories: marital status with no presence of children, marital status with the presence of children, race, and education. Married women’s participation rate increased from 43.7 percent in 1969 to 72.2 percent in 1999 with the most rapid gains happening during the 1970s and 1980s. The participation rate of married mothers increased 26.9 percentage points from 1969 to 1989, then rose at a much slower rate during the 1990s, and eventually began to decline slightly. Single mothers experienced a rapid increase in LFPR beginning in 1989 and reaching 75.4 percent in 1999. Juhn and Potter (2006) speculated that this observation arose from the Welfare Reform Act in 1996. Other possible explanations for the changing LFPR of women included increasing divorce rates, changes in household technology, and changes in husbands’ income. Similarly, Falzone (2017) credited this rise to a number of factors including social attitudes, an increase in the number of women in the population due to the “Baby Boom” generation, and new reproductive technologies.

**DATA**

*Data Sources*

This study analyzes data obtained from Federal Reserve Economic Data (FRED), the United States Census Bureau, and the United States Bureau of Labor Statistics (BLS) for the 51-state sample over 11 years between 2000 and 2010. The starting year for the study is 2000 because data for all of the independent variables prior to this date were inconsistently available at the state level.
Variables and Hypotheses

Demographic Independent Variables (DEMOGRAPHIC)

The demographic variables (AGEDEP, BLACK, FAGE, FPOP, OTHERPOP, and WHITE) are intended to break down the population of each state to analyze the various groups. Percent of population that is female (FPOP) is used as a demographic variable for the specific population of the US being tested in this study. FPOP also provides an understanding of whether there is a higher male or female population in each state. The expected coefficient sign for this variable is positive, because as the female population in the US increases, it would be expected that more females would enter the labor force. Some demographic variables that are believed to have ambiguous coefficient signs include the percent of population broken down by race (BLACK, OTHERPOP, and WHITE) and the median age of females (FAGE).

The old-age dependency ratio (AGEDEP) is the ratio of older dependents age 65 and older to the working-age population ages 15 to 64. This variable is believed to have an ambiguous coefficient sign. AGEDEP could be negative in sign, because as the number of older dependents increases relative to the working-age population, female LFPR could decrease because they have to stop working to care for the older dependents. However, the variable’s sign also could be positive because the working-age population may need to work more in order to financially support those dependents.

Education Independent Variables (EDUCATION)

Szulga (2014) found that women with higher levels of educational attainment participated in the labor force more than those who had a lower level of educational attainment, and concluded that the educational attainment of women was a significant factor in determining their LFPR. This study’s data measures the percent of the total population that has graduated high school (HS) or completed a four-year college degree or higher (COLLEGE), so there may be some discrepancy in the data compared to that of Szulga (2014). However, Szulga’s (2014) theory is applied, and the coefficient signs for both COLLEGE and HS are hypothesized to be positive.

Family Independent Variables (FAMILY)

The family variables (DIV, MAR, and NEVMAR) are intended to further break down the population of the states to view how the LFPR of women responds. The marital status of a female who is married (MAR) is expected to have a negative coefficient sign. Ganguli, Hausmann, and Viarengo (2014) predicted that being married resulted in fewer females who felt the need to work while their husbands work. Thus, it decreased the LFPR of women. Additionally, they explained that being divorced (DIV) or never having been married (NEVMAR) is expected to have a positive relationship with the LFPR, because the women may have no other sources of income; therefore, the female must work. This study’s data differs from Ganguli et al. (2014) because it measures the percent of the total population that is married, divorced, or never married, instead of only measuring the percent of the female population. Although the same rationale is applied, there may be a difference between the actual results and this hypothesized sign.
Economic Independent Variables (ECONOMIC)

Economic variables included in the models are FINC, GSP, HINC, HOMEVAL, REC, and UNEMP. These variables measure any monetary values in real terms. The rate of unemployment (UNEMP) and a dummy variable identifying years of economic downturn (REC) are also included because they both reflect the economic conditions of the states. REC is expected to have a negative coefficient sign. Szulga (2014) proposes an ambiguous expected sign for the unemployment rate, as it acts as a proxy for labor market conditions when analyzing the aggregate LFPR. HOMEVAL and GSP are both hypothesized to have positive coefficient signs. The real median value of a home (HOMEVAL) acts as a proxy for the cost of living in each state. As a result, HOMEVAL is hypothesized to have a positive relationship with LFPR. Real Gross State Product (GSP) measures the economic activity of each state of the US. GSP increases may indicate that more individuals are working; therefore, GSP would have an expected positive relationship with LFPR.

The expected coefficient sign for the real median household income (HINC) is ambiguous because, as explained by Ganguli et al. (2014), the variable does not indicate whether the household income is being earned by a male or a female. Additionally, the variable does not indicate any work or leisure trade-offs that could occur within the household. Similarly, Ganguli et al. (2014) also explained why the expected sign for real median female income (FINC) is ambiguous. An increase in female income could cause one of two things to happen. First, if a female’s income increased, then the increased income could become an incentive for her to work more for more money, which would yield a positive relationship. Conversely, an increase in income could cause the female to work less because she would be able to work fewer hours and still earn the same amount of money as when she was making less, but making more. She would then have more leisure time, and this would cause the sign on this variable to be negative. A complete list of variable descriptions and their expected signs can be found in Table 1.

Descriptive Statistics

The descriptive statistics for the dependent variable and all independent variables can be found in Table 2. The mean of the LFPR of women is 72.76 with the highest value in 2008 in South Dakota at 82.3. The minimum value was 61.8 occurring in West Virginia in 2000, which was the first year included in the sample. The mean of AGEDEP is 19.77 with a maximum of 28.60 in Connecticut in 2006 and a minimum of 9.60 in Alaska in 2000. Within the race variables, WHITE has the highest mean at 78.62. Its maximum is 96.9 in 2000 in Maine. The minimum is in Hawaii in 2000 at 24.3. The white population is so low in this state because the majority of its population are Native Hawaiians or other Pacific Islanders. Looking at the mean values for the education variables, the mean of COLLEGE is 25.86 and the mean of HS is 30.10.

ECONOMETRIC MODEL
Model Specification

This study utilizes a two-way fixed effects model, based on the results of a Hausman specification test, to measure the impact of demographic, economic, education, and family factors on the LFPR of women in a panel of the 50 states and the District of Columbia from 2000 to 2010. The model is as follows:

\[
LFPR_{it} = \beta_0 + \beta_1 \text{DEMOGRAPHIC}_{it} + \beta_2 \text{ECONOMIC}_{it} + \beta_3 \text{EDUCATION}_{it} + \beta_4 \text{FAMILY}_{it} + \alpha_i + \lambda t + \epsilon_{it}
\]

where DEMOGRAPHIC includes AGEDEP, BLACK, FAGE, FPOP, OTHERPOP, and WHITE; EDUCATION consists of COLLEGE and HS; ECONOMIC contains FINC, GSP, HINC, HOMEVAL, REC, and UNEMP; and FAMILY encompasses DIV, MAR, and NEVMAR.

Econometric Issues

A Breusch-Pagan test was run to check for heteroskedasticity. The results showed that all of the models were homoskedastic. Concerns over possible endogeneity bias were checked in all models by using the Hausman t-test. The results of the Hausman tests showed that there is no endogeneity present within the models.

RESULTS

A number of Wald tests were conducted in order to check for joint significance. The first test checked for the joint significance of the education variables, which include HS and COLLEGE. Another test was run on the race variables (BLACK, WHITE, OTHERPOP). Finally, a third Wald test was conducted on the three marital variables (DIV, MAR, NEVMAR). The results of these tests show that each of the three groups is jointly significant minimally at the 5% level. Consequently, these variable categories are included in different versions of the model with the other significant variables. These econometric models can be found in Table 3.

Model 1

This first model consists of the three core variables carried throughout the following regressions, which include AGEDEP, HINC, and HOMEVAL. All of these covariates are significant at the 1% level according to their t-statistics. The hypothesized coefficient sign of HOMEVAL was positive and this is supported by the regression results. HINC and AGEDEP are found to be negative in sign. The R-squared value for this regression is 0.980 and the adjusted R-squared is 0.978.

Model 2
Model 2 includes the three core variables, but it also adds the educational attainment group, according to Falzone (2017). In this model, HS is found to be significant at only a 10% level and COLLEGE does not attain significance. This would suggest that receiving a high school diploma affects the LFPR of women more than earning a college degree. The sign attached to HS was predicted to be positive, however, in the regression results it is shown to be negative. The R-squared and adjusted R-squared rose slightly in this model to 0.981 and 0.978, respectively.

Model 3

This model removes the educational attainment variables and, instead, adds the marital status group. All three of these variables are found to be significant, but at different levels. MAR is significant at a 10% level, DIV attains a 5% level, and NEVMAR reaches a 1% level. The expected coefficient sign on DIV was positive, but it is revealed to be negative in the results. The hypothesis stating that the expected sign on MAR should be negative is verified. One reason for this could be that fewer women are working when they are married to a working male and perhaps are spending more time raising kids. However, Cebula and Coombs (2008) found strong evidence that being married has a positive impact on female LFPR. NEVMAR was expected to have a positive coefficient and that hypothesis is confirmed by the findings. The R-squared and adjusted R-squared in this equation are 0.981 and 0.978, respectively.

Model 4

This model regressed the three core variables and the race group, which was shown to be jointly significant through the Wald test. However, none of the race variables in this model are found to be individually significant when looking at their t-statistics. All of the core covariates retained their 1% level of significance. WHITE, BLACK, and OTHERPOP all have negative coefficient signs in the regression. The R-squared and adjusted R-squared of this model remained consistent with the previous model of 0.981 and 0.978, respectively.

Model 5

This last model contains all of the variables that appeared in the previous equations. AGEDEP, HINC, HOMEVAL, and NEVMAR are all significant at the 1% level. Despite numerous other studies conducted on education and LFPR, such as Falzone (2017) and Szulga (2014), only HS was found to be significant at a 5% level and COLLEGE never gains significance. HS still has an unexpected negative sign. One possible explanation for this is the opportunity costs that some women face by not getting a higher education. In this model, as well as in Model 3, NEVMAR has a strong positive correlation with the LFPR of women. The R-squared for this model is 0.982 and the adjusted R-squared is 0.979. These are both the highest values of any previous model in this study.

Empirical Results

The old-age dependency ratio is found to be significant throughout every model in this study. With the addition of the marital, educational, and race variable sets, AGEDEP remains
significant at a 1% level. The old-age dependency ratio will only continue to increase in the upcoming decades as a result of higher life expectancy. According to the World Bank Group, it has risen from 18.40 percent in 2005 to 23.47 percent in 2017, and it is expected to increase even further. For future policy consideration, this finding is something that the government might want to further investigate.

While conducting the regressions, there were some variables that were never found to be significant. Among these are the GSP, REC, and UNEMP. Cebula and Coombs (2008) looked at the female unemployment rate and found it to be significant, contrary to the results in this study. Potential reasons for these differing outcomes include discrepancies in measurement and omitted variable bias.

A complete table of the five empirical models, along with the R-squared and adjusted R-squared, can be found in Table 3.

<<Table 3 here>>

Elasticities

Elasticity is a method to measure responsiveness of one variable in relation to another variable. The elasticity of LFPR with respect to AGEDEP is \(-0.075\), which is inelastic. This number tells us that a 10 percent increase in AGEDEP will reduce LFPR by 0.75 percent. According to the elasticity of LFPR with regard to HINC, which is \(-0.04\), a 10 percent increase in HINC will drop LFPR by 0.4 percent. Finally, LFPR will increase by 0.09 percent following the elasticity of LFPR regarding HOMEVAL. The elasticities of these independent variables can be found in Table 4.

<<Table 4 here>>

CONCLUSIONS

The results of this study provide meaningful insight into the female labor force participation rate. Throughout the models, AGEDEP, HINC, and HOMEVAL remain highly correlated with the dependent variable. NEVMAR also retained its significance in both Model 3 and Model 5. It is these covariates that best explain the changes in the LFPR in this sample.

Despite the extensive literature conducted on education, this study did not find COLLEGE to be significant in the models. However, HS did show significance in Model 2 and in Model 5. One possible interpretation is that the jobs that women are pursuing only require a high school diploma. Another possible explanation is that women are starting families after high school instead of pursuing a college degree.

Policy Implications

Some policies already exist to promote increasing the LFPR of women, such as the FMLA, which offers job security for women who take a leave of absence for family or medical reasons. However, many additional policies could also be implemented to further increase the female LFPR based on the results of this study. One way to encourage more women to enter the labor force would be to create a free or subsidized elderly care program. With the old-age dependency ratio being such a significantly negative variable in the study, it is conceivable that people end up leaving the labor force once they become responsible for
the care of their elderly dependents, usually their parents; and a majority of these caregivers may be female. Thus, an elderly care program, similar to a nursing home, would help to alleviate the burden of caring for elderly dependents or having to identify and pay for elderly care. This potentially would encourage women to enter and/or remain in the labor force.

**Extensions of Research**

This sample only considers data from 2000 to 2010, which is a relatively short time frame for analyzing this issue. One extension would be to expand the sample to include more years of data and including more recent years. Another extension could be to separate the labor force into different industries. This would allow for a closer examination of each industry and occupational stereotypes in order to identify what percent of an industry’s employees are male and female, instead of analyzing the aggregate labor force. Lastly, similar to the inclusion of the old-age dependency ratio, the young-age dependency ratio could also be included. The young-age dependency ratio is the ratio of the population ages 0-14 to the working-age population ages 15-64. Sanchez and Kim (2018) observed that while the old-age dependency ratio increased by 50 percent between 1960 and 2016, the young-age dependency ratio decreased by 43 percent. Therefore, the young-age dependency ratio could also have a notable impact on female LFPR.

**REFERENCES**


Table 1. Variables and Expected Signs

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<thead>
<tr>
<th>Variable Name</th>
<th>Description</th>
<th>Expected Sign</th>
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</thead>
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<tr>
<td>LFPR</td>
<td>Labor force participation rate of women</td>
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</tr>
<tr>
<td><strong>Dependent Variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGEDEP</td>
<td>Old-age dependency ratio is the ratio of old dependents to the working-age population</td>
<td>(?)</td>
</tr>
<tr>
<td>BLACK</td>
<td>The percent of the population that is black</td>
<td>(?)</td>
</tr>
<tr>
<td>FAGE</td>
<td>The median female age in each state</td>
<td>(?)</td>
</tr>
<tr>
<td>FPOP</td>
<td>The percent of the population that is female</td>
<td>(+)</td>
</tr>
<tr>
<td>OTHERPOP</td>
<td>The percent of the population that is a race not specifically identified or are two or more races</td>
<td>(?)</td>
</tr>
<tr>
<td>WHITE</td>
<td>The percent of the population that is white</td>
<td>(?)</td>
</tr>
<tr>
<td><strong>Independent Variables - Demographic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COLLEGE</td>
<td>The percent of the population that has completed a four-year college degree or higher</td>
<td>(+)</td>
</tr>
<tr>
<td>HS</td>
<td>The percent of the population that has only graduated high school</td>
<td>(+)</td>
</tr>
<tr>
<td><strong>Independent Variables - Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIV</td>
<td>The percent of the population that has been married but is not currently married</td>
<td>(+)</td>
</tr>
<tr>
<td>MAR</td>
<td>The percent of the population that is married</td>
<td>(-)</td>
</tr>
<tr>
<td>NEVMAR</td>
<td>The percent of the population that has never been married</td>
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<td><strong>Independent Variables - Economic</strong></td>
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<tr>
<td>FINC</td>
<td>Real median female income of all women in the workforce</td>
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</tr>
<tr>
<td>Variable</td>
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</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>---------------</td>
</tr>
<tr>
<td>GSP</td>
<td>Real gross state product</td>
<td>(+)</td>
</tr>
<tr>
<td>Variable Name</td>
<td>Description</td>
<td>Expected Sign</td>
</tr>
<tr>
<td>HINC</td>
<td>Real median household income for all households in the state</td>
<td>(?)</td>
</tr>
<tr>
<td>HOMEVAL</td>
<td>Real median value of all homes in the state</td>
<td>(+)</td>
</tr>
<tr>
<td>REC</td>
<td>Dummy variable for whether or not the majority of a certain year was in a recession: 0=no, 1=yes</td>
<td>(-)</td>
</tr>
<tr>
<td>UNEMP</td>
<td>The unemployment rate of each state</td>
<td>(?)</td>
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Table 2. Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
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<td>0.3</td>
<td>11.37382</td>
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<td>COLLEGE</td>
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* variables are significant at a 10% level  
** variables are significant at a 5% level  
*** variables are significant at a 1% level
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THE IMPACT OF DOWRY PAYMENTS ON WOMEN’S EDUCATION IN NEPAL

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Franklin & Marshall College

Tony Maynard
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ABSTRACT

The wealth of a nation is determined by the skills, health, knowledge and resilience of its citizens. These are all aspects of an individual’s human capital. Should an emphasis be placed on the development of these human capital, individuals can become more productive and innovative. These are required traits in the current and ever-changing technological landscape. And these individual traits lead to economic transformation for nations, due to their centrality in entrepreneurship, engagement and economic growth. These will also be key to nations’ ability to compete in the economy of the future. Citizens’ gain of knowledge through education, then, is one of the key components of economic development of any nation. In Nepal, however, of 26.5 million people who were surveyed in Nepal’s 2011 census, only 16.1 million (~60%) were considered literate (able to read, write and count). A much smaller proportion, 12.5%, of Nepalese citizens have completed an education beyond grade 10. Women face even lower education rates in Nepal, with the gender disparity in education attainment starting at the literacy level and widening as the level of education increases. Women lag behind men at every educational level. In this paper, I describe the difference in educational attainment and outcomes of males and females, introduce the institution of dowry as a factor that impacts educational outcomes in Nepal and provide an economic analysis of the situation.

The payment of dowry serves as a gender discriminatory practice, negatively affects young girls’ life opportunities and diminishes their chances of gaining more education. This paper analyzes reasons for the existence of dowry, the economic effects of dowry, the need and direction for future research, and proposes policies that would help reduce the gender discrimination created and reinforced by dowry.

INTRODUCTION

Dowry payments involve the bride’s family giving money and other valuable goods to the groom’s family as part of the marriage arrangement. So, it is a transfer of wealth from one family to another. A similar practice continues in parts of Africa though the payment flows in the opposite direction from the groom’s family to the bride’s and is called bride-price or bride-wealth. Payment of dowry was once common across much of the world, although now it has largely died out except in South Asia.

Dowry is often theorized as being most conformable with a hierarchical society with an endogamous marriage system. This framework fits India, which is a majority Hindu country with a hierarchical caste system and relatively strict marriage limits within the caste (Jaggi
2001). However, paying of dowries is also common in the neighboring countries of Bangladesh and Pakistan both of which have majority Muslim populations. Dowry is also widespread in Sri Lanka, with a predominantly Buddhist population. However, the population of Bhutan, which is also largely Buddhist, does not have dowry payments. Clearly the practice is not limited by religious dictates and seems to have persisted due to cultural influences. Bangladesh and Pakistan were, for centuries, part of India and the ethnic populations of Sri Lanka and southern India are very similar. Both religion and the broader cultural influences can be seen in Nepal, the country we focus on in this paper.

Nepal has a large population ethnically close to that of the northern population of India; Hinduism, like in India, is the most common religion. In marriage the caste affiliation is usually binding, and dowry payments are typical of marriage arrangements.

Economic analysis of dowry payments mostly elaborates on the neoclassical framework developed by Gary Becker beginning with his Economic Theory of Marriage. That is to say, payment of dowry can be explained by utility maximizing behavior of people in “the marriage market.” The broader institutional structures in society are treated as given (Becker 1974). For example, the fact that women tend to marry older men, or the existence of a hierarchical caste system, are treated as constraints within which marriages are arranged. Starting from this perspective, four explanations have been proposed for the existence and the size of dowry payments.

First, the “marriage squeeze” treats dowry straight-forwardly as a market clearing price; Second, “pre-mortem inheritance,” which denies that dowry payments are, in fact, a dowry at all, but, instead, a bequest from living parents to their daughter at the time of her marriage (Anderson 2007). The third assumes dowry payment is partly a pre-mortem inheritance and partly a market-clearing price; and the fourth explains dowry payments as resulting from differences in human capital accumulated by women and men (Anderson 2007). I will briefly explain the first three and then examine the fourth -- divergent human capital accumulation -- which is mostly concerned with formal education and is the focus of this paper.

The simplest place to begin an economic analysis is with supply and demand determining a price in a market. The “marriage squeeze” model, as it is called, argues that dowry exists because of an imbalance of between number of marriageable women and men in the marriage market (Becker 1974). A dowry – a wealth transfer from the bride’s family to the grooms – provides prima facie evidence that the demand for men must exceed the supply of men. Consequently, dowry is a market clearing price that results from the competitive bidding for husbands.

Pre-mortem inheritance concerns the timing of bequests to children. At marriage the bride leaves her birth family and becomes part of her husband’s family. Because daughters marry out of the family, on the death of her parents, any wealth is inherited, post-mortem by the sons in her family. Dowry, therefore, is the share of the family wealth that the daughter takes with her when she ‘leaves’ her birth family and joins her husband’s family.

A third explanation takes an evolutionary approach and combines the notion that dowry is originally a pre-mortem inheritance, but due to modernization, current payment includes an additional market clearing price. The argument here is that modernization has destabilized the traditional status of wealth by introducing a more heterogenous range of market incomes. This is especially the case for male incomes. As income levels become more differentiated, the dowry payment becomes more subject to competitive bidding and, hence, a market price.
Hence the pre-mortem inheritance is supplemented by payment of an additional groom-price to secure the most economically attractive husband (Jaggi 2001).

A more elaborate explanation points to differences in the accumulation of human capital. Women in the marriage market tend to come with a homogenous set of skills. They are trained, mostly informally, to manage a household through cooking, cleaning, raising children and so on. While these skills are valuable within the household, her human capital makes her earnings potential in the labor market relatively low. On the other hand, men have heterogeneous skills, particularly due to more formal education, and can earn a higher wage on the labor market. Consequently, men contribute more to total household income than women. However, the woman’s share of household consumption has a greater value than her contribution to household production, and a man’s consumption is correspondingly lower. Consequently, during the marriage a man subsidizes his wife’s consumption. Dowry is then explained as an initial compensation for the bride’s family for the future subsidization of the bride’s consumption.

The education level of the bride is pertinent to some degree for all these interpretations for dowry payments. However, it is most significant, for our purposes, in terms of the human capital model explanation for dowry payments. The human capital model, as we have seen, explains the dowry as a compensation for the wife’s lack of income-generating human capital.

However, the fact that daughters accumulate few marketable skills in these societies is due to the prevailing institutional structure that shapes the typical gender roles in these societies. In other words, the choices that families make for their sons and daughters are tightly constrained by the cultural environment, and this environment, is taken as given.

What we want to do is, basically, to flip over the human capital model and instead of explaining dowry payments as a result of low human capital accumulation, explain the low capital accumulation as a result of the existence of dowry.

HUMAN CAPITAL THEORY IN THE CASE OF NEPAL

In Nepal, women face low education attainment, with the gender disparity in education attainment starting at the literacy level and widening as the level of education increases (Census 2011). Women lag behind men at every educational level. This lack of human capital accumulation through education for women results from and perpetuates social hierarchy.

Women’s ability to command equality in the workforce is reduced because of their dual role – reproductive and productive. Since social perception of women’s role centers on their reproductive abilities, their productive abilities are discounted in the labor market. Furthermore, the disparate educational attainment, too, hampers women in the workforce.

Nepal and Dowry

Gender discrimination in Nepal is perpetuated in many forms. Dowry is one of the most culturally ingrained means for committing gender discrimination and has far-reaching consequences on the lives of females. Child marriage is intertwined with dowry. Both dowry payments and child marriage are illegal under the Nepali constitution. Nonetheless, they continue to be widely accepted and practiced.

Prior to 2016, the legal age of marriage in Nepal was 18 (in 2016 it was raised to 20). However, reports on Nepal’s demographics from the United Nations in conjunction with the
government of Nepal, suggest that child marriage is rampant. Almost 15% of women were married before age 15, and 50% are married before age 18. The Nepal census of 2011 draws a grimmer picture showing that 75% of women reported that they were married before age 16, with the median age of marriage being 13 (Census 2011).

Education and Economic Development

If we track the extent of economic and human development across developed nations, we see that large proportion of their populations are highly educated. While the literacy rate in Nepal is around 65%, the threshold of literacy isn’t a strong indicator of human or economic development. The number of citizens who are educated beyond grade 10 is under 20% of the population. For comparison, the United States has an 88% high-school graduation rate, and the numbers for Germany is 86%.

A further disparity exists in education attained by males and females. At every level of education, from pre-K to postgraduate, women are significantly outnumbered by men, both as an absolute number and a proportion. The institution of dowry, reinforced by social conditions and expectations for women, reinforces gender discriminatory practices in education and hence is a factor that plays an important role in educational attainment and other life outcomes that depend on education.

**DOWRY’S EFFECT ON EDUCATION**

Because parents are aware of the need to pay large sum of dowry to marry their daughters, they are unwilling to invest heavily in the education of their daughters. Further, because society values women’s work less than that of men, shown by difference in potential earning, the emphasis on the education of girls for the purpose of being economic agents is also reduced. Atop of that is the pressure of marrying daughters to ‘better off’ spouses in order to increase their family’s social standing. This requires meeting demands for large sums of dowry driven by emulation of elite classes. These combine to reduce the ability and incentive for parents of lower economic classes to emphasize and invest in the education of daughters. This is especially more severe when poorer families have both daughters and sons. Parents with children of both genders typically choose to invest significantly more in their sons’ education than in their daughters’.

The existence of dowry, then, directly impacts human capital accumulation by women due to the tradeoff that parents have to make with the money they have available to spend. Given the circumstances and social traditions, the viable choices are:

1. Send their daughter to school, get them educated, then she marries, with a high dowry payment and heads off to live in her spouse’s household; or
2. Spend little on education, devote the money to the daughter’s dowry, and marry her off as young as possible.

The choice, for poorer families, is typically the second.

**Social Conditions of Nepal and Dowry**

Due to their emphasis on tradition and culture, adults in rural areas are averse to the changes in relationship structures and dating practices being introduced into Nepal from western cultures. Young people, on the other hand, are more willing to try new social trends.
Although the social change occurring is allowing families to marry off their daughters at later ages, and government provisions allow for educating daughters at little to no cost, the age at first marriage of girls does not seem to be declining as rapidly as would be expected.

An explanation could be that families in rural areas, to prevent being socially stigmatized because of a daughter’s pre-marital affair, hastily arrange marriages before daughters commit an act that might shame the family. Given that educational attainment beyond secondary level entails pubescent males and females in close proximity, the perceived risk for girls’ families may be amplified. The possibility of a girl continuing her formal education after marriage is also unlikely.

_Dowry and Type of Degree through Education_

The type of degree that men and women attain in Nepal is heavily gendered. Analysis of Nepal’s 2011 census data shows that men outnumber women in nearly every field of secondary and higher education. Men make up 75% to 88% of those who graduated with science, mathematics, computing or engineering degrees. They also make up 60%-70% of those with degrees in social sciences and journalism. Women are only on par with men in the fields of education (i.e., teaching). The graph highlights the disparity between women and men by type of degree or education obtained.

A surprising, though misleading, data point is the fact that women outnumber men in the field of ‘Health.’ 52%, a slight majority, of those with degrees in health-related subjects are women. However, in the health sector in Nepal women are typically concentrated in nursing, whereas men are more typically physicians.

This difference in health care education appears to come from the reluctance of parents to invest high amounts of money in the education of daughters.

The cost of education in Nepal differs by the subject studied. Sciences, medicine, and engineering are costlier subjects to study than are humanities, arts, and education However, the cost of a bachelor’s degree in Nursing is in the same range as non-science fields. A degree in Nursing is about fifty-five hundred dollars, whereas a bachelor’s degree in medicine costs closer to fifty thousand dollars.

_Dowry, Education and Employment_

The types of degree women have, combined with the social perception of women in the workforce, can severely reduce the type of paid employment women seek. Concern of employment also plays a role in what degrees Nepali citizens strive for. Because women are concentrated in humanities, arts, and education, their earning potential is smaller than potential earnings in the sciences, math and engineering. Even in fields with high earning potential, like health, women are primarily working as secondary health-care providers, such as nurses, rather than having leading roles in healthcare, like that of doctors and surgeons.

Because parents are reluctant to take on high costs of education for girls, girls are barred, without choice, from gaining high-potential degrees in subjects that have higher employability and potential income. Women are systematically repressed in the workforce, having to accept low-paying jobs in low-paying sectors, rather than having the opportunity to decrease the gender gap in skilled workers in many of the scientific fields.

This phenomenon also has an intrinsic feedback loop. Women’s earnings after attaining degrees are used as the precursor for the value of educating girls. Educated women, overall,
earn less than men because more men are in fields that have higher paying jobs than women are. Judging the value of educating women based on current earnings necessarily re-enforces the assumption that sons represent valuable economic agents while daughters do not.

CONCLUSION

The phenomena described above together makes socially acceptable gender discrimination in education. For the average Nepali family, daughters do not get educated in the same way that sons do: girls are sent to public schools, boys to private schools. Girls are more likely to become nurses; boys, doctors. Girls are more likely to become school teachers; boys, engineers. The examples of disparate outcomes affect the perception and prospect of educating women and the lack of emphasis on educating girls leads to disparate human capital accumulation and, consequently reduces the economic potential of the country as a whole.

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PENNSYLVANIA RESOURCE MANUFACTURING TAX CREDIT

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ABSTRACT

The Pennsylvania Resource Manufacturing, PRM, Tax Credit creates a tax incentive for an ethylene manufacturing facility purchasing ethane to locate in Pennsylvania. The Credit is equal to $0.05 per gallon of ethane purchased from January 1, 2017, to December 31, 2042. Royal Dutch Shell projects the operation of the Pennsylvania Monaca facility site in late 2021 or early 2022. The static fiscal impact is projected at $65 million per year with a cumulative total impact of $1.65 billion. While the PRM Credit reduces the tax base by the amount of the credit, the Credit incentivizes the development of the ethane processing industry resulting in an expected expanding tax base and revenue for Pennsylvania.

I. INTRODUCTION

Pennsylvania’s natural gas resources, which include both the Marcellus and Utica shale gas formations, present opportunities for accelerated economic development and growth (Armstrong, 2017). The Marcellus shale gas formation extends to two-thirds of Pennsylvania and into neighboring states of New York, Ohio, and West Virginia. The Utica shale is about 170,000 square miles, deeper and nearly twice the size of the Marcellus shale, and extends in parts of Quebec, Canada and in New York, Ohio, and West Virginia. The Marcellus and Utica natural gas production accounts for a quarter of all natural gas produced in the United States and projected to account to more than 40 percent of the nation’s natural gas production by 2030 (IHS Markit, March 2017).

From the U.S Energy Administration, Pennsylvania in 2017 is the second ranked state behind only Texas for natural gas marketed production 5.463 to 7.135 million cubic feet respectively. With Pennsylvania continuing to produce increasing volumes of low-cost, upstream natural gas, a key component of the “wet gas” production is ethane along with propane are natural gas liquids (NGL) used in petrochemical production and plastics manufacturing. Ethane can be isolated from natural gas, converted to ethylene, and used as a petrochemical feedstock for plastics and many other downstream manufactured products. Currently, 100 percent of the ethane produced in Pennsylvania and recovered as a petrochemical feedstock is being shipped out of state for petrochemical processing (IHS Markit, March 2017).

Figure 1 from the American Chemical Council below provides a picture summary of the value-added Ethylene Chain for the ethane processing industry. The Chain can be divided into three activities: (1) Upstream Activity where Natural Gas containing Ethane is sold to the Cracker; (2) Midstream Activity where Intermediate Products containing ethylene and other petrochemicals are sold from the Cracker to Manufacturers; and (3) Downstream
Activity where retail sales occur from Manufactures to final consumers of products such as diapers, tires, etc.

Shell Oil Company, an American subsidiary of Royal Dutch Shell, selected one site from three locations in West Virginia, Ohio, and Pennsylvania to construct an ethylene cracker plant in the borough of Monaca in Beaver County, Pennsylvania on March 15, 2012, with an announced start to build on June 7, 2016. The plant is expected to open in late 2021 or early 2022 (Behr, July 20, 2018).

IHS Markit (March 2017) reports that the ethane-fed steam cracker will produce 1.5 million metric tons per year of ethylene with a cost of about 23 percent lower than from plants on the Gulf Coast. Ethylene will then be converted to more than 1 million metric tons per year of high-density polyethylene and 550,000 metric tons per year of linear low-density polyethylene-two of the fastest growing and largest volume plastic resins globally. The polyethylene plastic pellets, for example are a component of packaging and houseware products. Polypropylene fibers and resins are a component of carpets and high-performance plastics (Behr, July 20, 2018).

The location of the Monaca site is where more than 70 percent of the North American polyethylene customers are within a 700-mile radius for its customer base and close to its ethane natural gas supply in West Virginia, Ohio, and Pennsylvania. Delivery times for polyethylene to manufacturing plants can be up to a week as compared to three weeks from a Gulf Coast plant - a significant savings in time and costs.

Two key reasons for the Monaca site over the other state locations were location and speed of incentive legislation (Villarreal, September 2016). The relative speed of incentive legislation was realized within months of introduction by enacting of the Pennsylvania Resource Management Tax Credit (Act 85 – July 2, 2012) into law under Article XVII-G of the Tax Reform Code of 1971 (P.L. 6, No. 2) as amended under the Corbett Administration.

To utilize the Tax Credit, the business must build a facility purchasing ethane for use in an ethylene manufacturing cracker plant with a capital investment of at least $1 billion and create at least 2,500 full-time equivalent jobs during the construction phase. The Shell cracker facility is projected to costs significantly over the $1 billion creating 6,000 full-time construction jobs and 600 permanent jobs for employees working in the plant (Stonesifer, November 8, 2017; Villarreal, September 2016).

The Tax Credit may be used to offset 20 percent of a taxpayer’s Pennsylvania’s liabilities. Within one year after the credit is approved, a taxpayer can apply to the Department of Community and Economic Development for approval to assign or sell eligible credits to another taxpayer including upstream or downstream Pennsylvania taxpayers to offset up to 50 percent of its Pennsylvania tax liabilities.

Beginning in Fiscal Year 2022-23, the first full fiscal impact year projected by the Pennsylvania Department of Revenue at $65 million per year with a cumulative total impact of $1.65 billion.

Due to the increase production from the Marcellus and Utica gas fields by 2030, the supply of ethane could support up to four additional ethane cracker plants in the region over and above the Shell cracker (IHS Markit, March 2017). Figure 2 shows Shell ethane cracker facility location under construction and two planned facilities, one in Ohio and West Virginia.
The rationale for the PRM Tax Credit is to accelerate the development of one or more components of the energy production-cracking-manufacturing energy industry, where long-term benefits to the Commonwealth are expected.

The purpose of this paper is to provide a PRM Tax Credit background and a PRM Tax Credit analysis benchmarked against a subset of fundamental tax principles. Afterwards, a conclusion will be provided.

II. PENNSYLVANIA RESOURCE MANUFACTURING TAX CREDIT BACKGROUND

The rationale for the creation of the Pennsylvania Resource Manufacturing Tax Credit is to incentivize a robust petrochemical industry in Pennsylvania rather than passively allowing ethane to be pipelined to other areas of the country that already have well-established petrochemical industries. The Shell Monaca ethane cracker plant is the first major U.S. project of its type built outside the Gulf Coast region in 20 years.

The PRM Tax Credit is equal to five cents per gallon ($2.10 per barrel) of ethane purchased for use in manufacturing ethylene and is limited to 20% of the taxpayer’s qualified tax liability after taking into account all other credits.

The PRM Tax Credit, issued and approved by the Pennsylvania Department of Revenue (DOR), will be a nonrefundable credit against the Pennsylvania Corporate Net Income Tax, Personal Income Tax, Bank and Trust Companies Shares Tax, Title Insurance Companies Shares Tax, Gross Premiums Tax, Gross Receipts Tax, and Mutual Thrift Institutions Tax. Table 1 indicates current Pennsylvania state tax rates for 2019. A firm is not able to carry over any unused PRM Tax Credits.

PRM Credits earned by pass-through entities such as partnerships, LLCs and S-Corporations can be passed through to partners, members, or shareholders on a pro-rata basis pursuant to the equity ownership interest in the pass-through entity for Personal Income Tax (PIT) liabilities. The PRM Tax Credits must be applied in the year passed through. There is no carry forward, carry back, or refund of unused credits by partners, members or shareholders. The utilized Credits cannot exceed 20 percent of the total PIT liability by partners, members or shareholders.

A taxpayer may apply for a PRM Tax Credit by submitting an application no later than March 1st to DOR. In addition, an affidavit signed by the applicant’s president or designee in the form of a letter to DOR must state that the amount of ethane purchased by the taxpayer applicant is correct. DOR shall notify the taxpayer the amount of the approved taxpayer’s PRM Tax Credit by March 20th of the calendar year. The taxpayer or principals may immediately utilize the credit upon approval.

If a taxpayer holds a PRM Credit through the end of the calendar year in which the tax credit was granted, a business would be able to apply to the Pennsylvania Department of Community and Economic Development (DCED) for approval to sell or assign eligible Credits to another taxpayer. The taxpayer then can use the assigned or purchased credits to offset up to 50% of the assignee’s or buyer’s Pennsylvania tax liability with the assigned or purchased credit. The sale or assignment credits that must be used within the tax year approved for the assignment against Pennsylvania Corporate Net Income Tax, Personal Income Tax, Bank and Trust Companies Shares Tax, Title Insurance Companies Shares Tax, Insurance Premiums Tax, and Mutual Thrift Institutions Tax liabilities.
PRM Tax Credits must first be exclusively offered to downstream companies within 30 days of the approval of the credit. Afterwards, the Tax Credits must then be exclusively offered to upstream or downstream companies for a 30-day period following the downstream offer period. Once this period has ended, the Tax Credits can be offered to other taxpayers after exclusive provisions expire.4

The assignee or buyer is required to notify DOR of the seller of the PRM Tax Credits. The seller must get a tax clearance before the assignment or sale is allowed.

The calculation and administration of the PRM credit shall be done on a separate company basis without regard to how such entities file tax returns either for state or federal tax purposes. Purchasers of PRM Tax Credits, approved by DCED, would be a non-refundable credit. Credits can be applied against the same tax types as the seller. The PRM Tax Credits must be used by the buyer within the tax year approval of the assignment or sell. Credits may only be assigned or sold once.

While the PRM Tax Credit provides state tax financial savings for Shell Oil Company, the benefits due have constraints limiting its value. There are credit ceiling limits of 20% of state tax liability; sale or assigning of credits can offset up to 50% of the assignee’s or buyer’s Pennsylvania tax liability limits the transference value of the credit; and no carry forward, carry back, or refundable provisions further limits the value of the credit.

The PRM Tax Credit is an incentive for manufacturers purchasing ethane to locate processing facilities into the Commonwealth. In addition, firms can purchase PRM Tax Credits from a manufacturer, due to the assignment provisions, so as to reduce Pennsylvania tax liability.

If firms are upstream suppliers of natural gas containing ethane selling to a business manufacturing processor, the purchase of PRM Tax Credits can reduce the after-tax cost of supplying natural gas containing ethane as a petrochemical feedstock.

If firms are downstream Pennsylvania manufacturers who buy and use an ethane derivative from the manufacturing facility, the purchase of PRM Tax Credits can reduce the after-tax cost for these manufacturers too.

Generally, a taxpayer may claim a PRM Tax Credit unless the taxpayer is not in full compliance with state tax laws. The Department of Revenue shall have the authority to audit any person claiming this tax credit to ascertain the validity of the amount claimed. The Department of Revenue shall have the authority to issue an assessment for any improperly issued tax credit.

The effective date for the PRM Tax Credit program is January 1, 2017. The 25-year PRM Tax Credit program sunsets on December 31, 2042.

III. PENNSYLVANIA RESOURCE MANUFACTURING TAX CREDIT ANALYSIS

The PRM Tax Credit is examined relative to the five broad tax principles: adequacy, neutrality, equity, ease of administration, and accountability.5 It is recognized that no one tax credit will meet high standards to a full set of tax principles; nevertheless, a tax credit that meets high standards to as many of the fundamental tax principles as possible would constitute good state tax policy. While the list of fundamental principles is open to debate, tax policy experts tend to agree on five broad principles (Brunori, 2001; State Policy Reports, January 2002; and Armstrong, 2018).
A tax credit, which is one of three tax expenditures, is an amount of money that taxpayers can subtract from taxes owed to the government (Surrey, 1973). The justification for a tax expenditure and more specifically a tax credit is to provide an incentive to correct a market failure or to address a social concern (Thuronyi, 1988; Hungerford, September 13, 2006). The purpose the PRM Tax credit is to create an incentive to establish a petrochemical industry within Pennsylvania from upstream Pennsylvania suppliers of natural gas containing ethane to ethane Pennsylvania cracker facilities to downstream Pennsylvania manufacturers who buy and use an ethane derivative from the cracker facilities.

1. Adequacy. State revenue systems must raise revenue to pay for current and future public expenditures. Without considering dynamic economic growth and hence greater tax revenue over the long-term, the PRM Tax Credit reduces taxes owed to the Commonwealth of Pennsylvania on a dollar-for-dollar basis.

Table 2 provides nominal PRM Tax Credit fiscal impact estimates from 2017-18 to 2023-24 from the Pennsylvania Department of Revenue. The estimated full year fiscal impact of $65 million from 2022-23 and each fiscal year afterwards until the program sunsets. The figures reflect 85,000 projected barrels per day feedstock intake into the cracker plant multiplied by the PRM Tax credit of $2.10 per barrel and then increased to reflect a full fiscal year. Of course, any change in barrels per day intake and any days not receiving barrels will change the PRM Tax Credit estimates for a fiscal year.

While the PRM Credit reduces the amount of tax revenue to be received by the state government of Pennsylvania by the amount of the credit, the PRM Tax Credit incentivizes the acceleration of the development of the ethane processing industry into the state resulting in an expected expanding sales thereby increasing sales tax revenue; expanding business profits and pass-through income thereby increasing tax income tax and corporate tax revenue; and expanding direct, indirect, and induced employment increasing personal income tax revenue.

2. Neutrality. While the imposition of taxes should minimally influence market decisions, the imposition of a tax credit is to change behavior to advance a social goal and correct a market imperfection. One such social goal and market imperfection is to enhance an economic development infrastructure and in particular expand innovation or competitiveness areas to continuously expand the stock of knowledge (see Armstrong, 2017).

“In instances where adjacent states with similar locational advantages are vying for the same facility, the value of the economic incentive package can be a crucial tiebreaker,” from IHS Markit (March 2017). While it may never be known that the PRT Tax Credit was the key reason for Shell to locate a cracker plant in Monaca, Pennsylvania, the PRM Tax Credit does reduce the cost of financing and maintaining the ethane cracker plant and to develop a petrochemical industry. Shell is constructing the following (IHS Markit, March 2017; Stoneisier, February 4, 2019):

1 ethane cracker plant
3 polyethylene units
250-megawatt natural gas-fired power plant
900-foot-long cooling tower
water-treatment plant
95 miles of pipe
office building
laboratory
85,000 square foot innovation center

3. Equity. The equity concept generally revolves around two considerations: horizontal and vertical equity. Horizontal equity suggests that two entities that receive the same taxable income should be taxed equally. Vertical equity suggests that differently situated taxpayers should be taxed differently. Tax expenditures, by way of a credit may harm horizontal equity but may or may not advance vertical equity.

Taxpayers who receive the PRM Tax Credit would narrow the tax base where horizontal equity would be violated; however, given the extent of investment and risk of establishing a profitable ethane processing cracker plant differences in vertical equity is expected.

4. Ease of Administration. Sound tax credit policy requires minimizing the costs of compliance for taxpayers and collection costs by government. As a tax system becomes more complex for businesses and individuals, more time and resources will be spent determining the requirements and attempting to minimize the tax credit requirements of the law. Economic inefficiency results where resources could be better spent in other areas.

While no application has been finalized by the Department of Revenue, the application is expected to be a relatively simple determination of the amount of ethane received by the cracker with periodic independent certification and verification. As mentioned, Shell would apply for a PRM Tax Credit by submitting an application no later than March 1st to the Department of Revenue (DOR). DOR shall notify Shell the amount of the approved taxpayer’s PRM Tax Credit by March 20th of the calendar year.

In addition, no application has been finalized by the Department of the Community and Economic Development for approval to sell or assign eligible PRM Tax Credits to another taxpayer. The expectation is a simple application requiring minimal time and resources by Shell and the sale or assigned taxpayers to complete the application.

Faulk (June 2002) classifies the costs of a credit into the following categories: (1) search costs, (2) compliance costs, (3) costs associated with providing additional information to the government, (4) hiring costs, and (5) additional federal liability.8

Search costs are costs associated with filing PRM Tax Credit, including the costs of finding other firms who can be sold or assigned the Credit having appropriate Pennsylvania tax liability. While the costs are expected to be minimal for filing of the credits to DOR and DCED, the costs of searching for other firms that can utilize a sold or assigned Tax Credit could increase to Shell.

Compliance costs are startup costs and annual costs. “Startup costs include the costs include the cost of learning about the credit, training staff, and setting up new forms and systems to capture the information necessary to claim the credit. Annual costs are the year-to-year costs associated with claiming the credit,” (Faulk, June 2002). Once the requirements of the PRM Tax Credit forms are established and initial Shell and firms sold and assigned Tax Credits, annual costs should be minimal.

Of course, DOR and DCED may require additional information so that the credit is applied and utilized correctly from the Pennsylvania taxpayers including Shell to the appropriate Pennsylvania tax liability. Depending upon the additional information requested, there will be additional costs.

Finally, the deductibility of Pennsylvania corporate income tax liability from federal income tax liability may increase the costs of the Pennsylvania Resource Manufacturing Tax Credit.

5. Accountability. Good tax policy should provide taxpayers with the true costs of providing public services (Oakland and Testa, 1994). From a tax expenditure perspective,
good tax credit policy not only provides the true costs of a credit but encourages the link between the tax credit and the economic objectives of the credit. The more visible the link, the more likely the credit will obtain the economic objectives at an acceptable cost (Hungerford, September 13, 2006).

The Pennsylvania Resource Management Tax Credit (Act 85 – July 2, 2012) law requires DOR to provide an annual report to the General Assembly including names of all qualified taxpayers utilizing the tax credit and the amount of tax credits approved, utilized, or sold or assigned by each qualified taxpayer.

In addition, the PRM Tax Credit law requires DCED to produce a ten-year reconciliation report on May 1, 2028, to the General Assembly detailing the state taxes generated by the ethylene manufacturing facility and any recommended changes or continuation of the credit. Transparent tax policy is to conduct routine evaluations of their tax revenue systems including tax credits (Armstrong, 2013).

IV. CONCLUSION

Pennsylvania’s competitive advantages for an ethane processing industry include cost and transportation advantages due to the abundance of natural gas and NGL, proximity to high-demand North American end use markets, infrastructure investments, a skilled workforce, and a foundation plastics manufacturing industry (IHS Markit, March 2017).

The PRM Tax Credit increases Pennsylvania’s competitive advantages by incentivizing the acceleration of the development of the ethane processing industry including the upstream natural gas supply, midstream ethane cracker, and downstream manufactures using ethane derivatives.

The PRM Tax Credit is an incentive for a chemical manufacturing business purchasing ethane to locate an ethane cracker facility into the Commonwealth.

Firms can purchase PRM Tax Credits from a chemical manufacturing business, due to the assignment provisions, so as to reduce Pennsylvania tax liability. If firms are upstream suppliers of natural gas containing ethane selling to a chemical manufacturing business, the purchase of PRM Tax Credits can reduce the after-tax cost of supplying natural gas containing ethane as a petrochemical feedstock.

If firms are downstream Pennsylvania manufacturers who buy and use an ethane derivative from the chemical manufacturing business facility, the purchase of PRM Tax Credits can reduce the after-tax cost for the downstream manufacturers.

From a static perspective, the PRM Credit reduces the tax base by the amount of the credit. From a dynamic perspective, an expanding ethane processing industry will expand the tax base with a dynamic increase in tax revenue to Pennsylvania.

ENDNOTES

* The author would like to thank Joseph Crouse and a discussant for comments. All possible errors are the author’s.
1. The Capital Stock and Foreign Franchise Tax phase-out legislation was enacted under the Ridge Administration and completely phased-out under the Wolf Administration.
2. The Department of Revenue (DOR) will administer the PRM Tax Credit Program. The PRM Tax Credits are issued and approved by DOR. DOR shall designate forms or
schedules and promulgate regulations necessary for the implementation and administration of the PRM Tax Credit program.

3. The Department of Community and Economic Development (DCED) shall facilitate the Transfer/Sale or Assignment of Credits on designated forms or schedules for the implementation and administration of the program. DOR will perform tax clearances for applicants and credit verification on tax returns.

4. The seller business must hold PRM Tax Credits issued by DOR until the end of the calendar year the credit was approved. DCED will provide notification of approval on the sale of the Credits.

5. Generally, tax credits are not examined relative to all five tax principles but are examined to a narrower set, for example see Batchelder, Goldberg, Jr., and Orzag (2016).

6. Tax expenditures can be defined as a departure from the Haig-Simons definition of income, which is consumption plus a change in net worth over a given period (Thuronyi, 1988). Tax expenditures are deductions, exemption, and credits to reduce the overall tax bill. Deductions and exemptions reduce the amount of taxable income, while credits reduce a taxpayer’s taxes owed by the amount of the credit.

7. The research does not attempt to answer the question of whether the PRM Tax Credit create jobs that would not have been created in its absence (see Faulk, June 2002). This dynamic impact of an expanded ethane processing industry with an ethane cracker intake of 85,000 barrels per day including all the direct and indirect support industries could potentially create new direct, indirect, and induced employment of a little over 16,000 jobs. The Mid-Atlantic Technology, Research & Innovation Center (MATRIC) in South Charleston, W.Va., published an estimate that a full exploitation of Marcellus and Utica resources could in time create 25,000 jobs in chemical and plastics manufacturing in Pennsylvania, West Virginia and Ohio (Behr, July 20, 2018).

8. Faulk (June 2002) includes a sixth category: stigma cost. This cost is associated with the positive or negative stigma with utilizing a tax credit.

REFERENCES


Behr, Peter. (July 20, 2018) Ethane is about to crack in Appalachia. Now it needs a market. Energywire: 1-3.


Figure 1
Table 1: Pennsylvania State Tax Rates (2019)*

<table>
<thead>
<tr>
<th>Tax Type</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate Net Income Tax</td>
<td>9.99%</td>
</tr>
<tr>
<td>Personal Income Tax</td>
<td>3.07%</td>
</tr>
<tr>
<td>Bank and Trust Company Shares Tax</td>
<td>0.95%</td>
</tr>
<tr>
<td>Title Insurance Companies Shares Tax</td>
<td>1.25%</td>
</tr>
<tr>
<td>Gross Premiums Tax</td>
<td>2.00%</td>
</tr>
<tr>
<td>Gross Receipts Institutions Tax</td>
<td>50 mills</td>
</tr>
<tr>
<td>Mutual Thrift Institutions Tax</td>
<td>11.50%</td>
</tr>
</tbody>
</table>


Table 2: Pennsylvania Resource Manufacturing Tax Credit (Dollar Amounts in Thousands)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PRM Tax Credit Estimates</td>
<td>$0.0</td>
<td>$0.0</td>
<td>$0.0</td>
<td>$17.1</td>
<td>$49.6</td>
<td>$65.0</td>
<td>$65.0</td>
</tr>
</tbody>
</table>

Sources: 2019-20 Governor’s Executive Budget, February 5, 2019, Commonwealth of Pennsylvania
INCOME AND CLINICAL OUTCOMES: AN EMPIRICAL STUDY ON CARDIOVASCULAR INCIDENCE

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ABSTRACT

Findings from empirical studies in economics and medical research reveal that higher mortality and morbidity (i.e., worse health) are associated with lower socioeconomic status (SES). This so-called “Social Gradient” in health occurs globally. Our research aimed at finding the magnitude of this association at the individual level: the income (a proxy for the SES) and a specific clinical outcome, cardiovascular disease (CVD). CVD accounts for almost one-third of the death in the world and one-fourth of the death in the United States. Given the size of CVD incidence and its severity, we examined how it occurred across various level of the SES. The median household income data in the U.S. Census Bureau were matched to CVD patients from the Myocardial Infarction Data Acquisition System (MIDAS). Both Logistic and Cox Proportional Hazards models were applied to study the relationship between income and three cardiovascular clinical outcomes; readmission for acute myocardial infarction (AMI readmission), cardiovascular death (CV death), and all-cause death. Both models were estimated while controlling for other covariates available in the MIDAS database including demographical factors and comorbidities. Our main results indicate that patients with low income tend to have higher risk for the readmission for AMI. However, this relationship is mostly insignificant between income and CV or all-cause death. We hope that findings in this research may help better allocate limited resources to where they are in greater need.

INTRODUCTION

Findings from empirical studies in economics and medical research reveal that higher mortality and morbidity (i.e., worse health) are associated with lower socioeconomic status (SES). This association is termed “Social Gradient”. The Social Gradient in health is seen worldwide. It not only affects underdeveloped and developing economies but also rich and developed economies such as the United States. In other words, health inequality occurs everywhere with no boundaries. While there are different measures in the SES and health, our research aims at finding the magnitude of this association at the individual level. We focus on the relationship between the income (a proxy for the SES), and a specific clinical
outcome (cardiovascular disease abbreviated CVD). The statistics shows that CVD accounts for almost one-third of deaths in the world. CVD is also the leading cause of death for both men and women in the United States; and it accounts for one-fourth of deaths in the U.S. population. Given the size of CVD incidence and its severity, we would like to examine how it occurs across various level of the SES. More importantly, finding the relevance of this association may help us better allocate limited resources to where they are in greater need and improve healthcare accessibility in lower income areas.

The median household income data in the U.S. Census Bureau are matched to CVD patients from the Myocardial Infarction Data Acquisition System (MIDAS). The longitudinal data ranged from 2004 to 2015. All patients in this study are 18 years or older. Logistic Regression and Cox Proportional Hazards models are used to study the relationship between income and three clinical outcomes; readmission for acute myocardial infarction (AMI readmission), cardiovascular death (CV death), and all-cause death. Both models are estimated while controlling for other covariates available in the MIDAS database including demographical factors and comorbidities. Our main findings indicate that patients with low income tend to have higher risk for the readmission for AMI. However, this relationship is insignificant between income and CV or all-cause death.

This paper is organized as follows. Section 2 provides literature from relevant past studies; Section 3 indicates the source of the data sets, variable specifications, and some descriptive statistics; Section 4 briefly explains the structure of both logistic regression and Cox proportional hazards models; Section 5 summarizes the main empirical outcomes; and Section 6 concludes this study. The references, figures and tables are presented at the end of the paper.

**Literature Review**

“Social Gradient” is a global phenomenon that has been observed and studied over the years. Although it is a well-known fact that the commonly used SES measurements such as education or income are highly associated with various health outcomes, both SES and health variables are not well defined. The direction and strength of the association between SES and health outcomes can be subject to variable selection. Among various health outcomes, cardiovascular related disease is worth studying since it is one of the leading causes of deaths worldwide. In this paper, we intend to find the strength of the linkage between income and three well-defined cardiovascular related clinical outcomes; thanks to the availability of the U.S. Census and MIDAS data.

Due to the existence of abundant individual level data, many empirical studies have focused on the association between income and specific health measurement such as clinical outcomes in cardiovascular related diseases in the field of medical research. However, the results are mixed. For example, using myocardial infarction register data, Salomaa et al. (2000) found low SES was associated with increased coronary heart disease (CHD) mortality rate in Finland. They indicated that while the CHD declined by 60% due to improved treatment and prevention, the socioeconomic differentials in CHD mortality rates were not narrowed. Jakobsen et al. (2012) studied the impact of SES (using income, education, and employment status) with high and low level on CV related diseases such as cardiac death, recurrent myocardial infarction, and target vessel revascularization for a group of 7,385 patients after receiving primary percutaneous coronary intervention (PCI) in Denmark. They found that the low-SES patients had higher risk comparing to the high-SES patients. Using
telephone survey data, Lemstra et al. (2015) found that household income was not only strongly and independently associated with heart disease, it was also associated with its main disease intermediary, high blood pressure, and its main behavioral risk factors, smoking and physical inactivity.

While most of the recent studies revealed a strong negative association between SES and CVD, there were also studies pointed out either the strength of the negative association was overstated or did not exist based on empirical analysis. For example, Alter et al. (2006) found that income was strongly and inversely correlated with 2-year mortality rate using hazard ratio statistics. However, the strength of negative association was reduced after adjusting for other factors such as age, preexisting cardiovascular events and current vascular risk factors. Denvir et al. (2006) conducted a similar PCI study, comparing to the study done by Jakobsen et al. (2012), and found that SES, measured using the Carstair’s Deprivation Score, did not have an impact on the health outcome using a self-reported and health-related quality of life. Similarly, Britton et al. (2004) found no association between SES, as measured by social/ethnic differences using a civil service employment grade, and treatment of coronary heart disease through drugs or procedures in a South Asian civil servant population (aged 35-55 years old). Moreover, Kee et al. (1993) did not find a difference in the age-standardized catheterization-angiography utilizations rates for ischemic heart disease and patient’s zip code after controlling for clinical cofounders.

Besides the mixing outcomes from the recent studies, one challenge faced by researchers is about the conceptualization and measurement of SES. Kaplan and Keil (1993) provided a detailed literature review by summarizing the effects of SES on cardiovascular disease. They also emphasized that the measurement of SES should be multidimensional that includes education, income, occupation, employment status, indexes of social class etc. Most of those aforementioned measurements were difficult to obtain in observational data, so the empirical outcomes were subjected to the availability of the SES and thus mixed outcomes in various studies.

Using the Minnesota Survey data over two three-year (1980-1982, 1985-1987) periods for the total of 7,781 patients, Luepker et al. (1993) found that SES (using education, income, and occupations) were associated with coronary disease risk factors, morbidity, and mortality. Strauss et al. (2010) conducted a study to determine the association between multiple measures of SES and health outcomes in two Chinese provinces, Gansu and Zhejiang. Results showed that, SES using education, tended to be positively correlated with health outcomes. Similarly, a U.S. study by Winkleby et al. (1992) found that among three commonly used SES measurements (income, education, and occupation), only education showed a strong positive association with CV disease risk factors including cigarette smoking, blood pressure, total lipoprotein and high-density lipoprotein cholesterol using the Stanford Five-City Project data that involved 2,380 participants. Nevertheless, the other two dimensions of SES seem to play insignificant role in determining health outcomes.

The above related research indicates several common challenges in these types of study: (1) SES measurements are often multidimensional and their association with health outcomes such as CV related disease can be mixed. (2) Small sample sizes (usually in the thousands) may result in risks of errors or a potential sampling bias issue. (3) Most of the studies have a relatively smaller time dimension. In our paper, we overcome these three challenges by using the data retrieved from the Myocardial Infarction Data Acquisition System (MIDAS) database. Our filtered data includes a total of 178,520 patients over a twelve-year period (from 2004 to 2015). Although it is state-based, our findings could be
generalizable to other geographic areas in the United States. New Jersey has a large, diverse population with proportions of old and young as well as whites, Hispanics, and African Americans similar (within 10%) to the overall United States. Moreover, the rate of uninsured individuals in New Jersey is comparable to that reported in the United states overall (13.2% versus 14.5%). Meanwhile, the adoption of the Cox Proportional Hazards model can be used to examine whether the outcomes obtained from the Logistic Regression model are robust if both the time dimension of the data (duration or time-to-event) and the data censoring problem are taken into consideration.

EMPIRICAL MODELING

Two statistical models are used in this study, including Logistic Regression model and Cox Proportional Hazards model. We briefly address both modeling methods in this section.

Logistic Regression Model

Y is a binary variable with two possible outcomes 1 and 0, and the corresponding probabilities are P and 1 - P, respectively.

\[
\begin{align*}
Y &= 1 \text{ with probability } P \\
0 &\text{ with probability } 1 - P \\
E(Y) &= 1*P + 0*(1 - P) = P \\
\end{align*}
\]

(1)

The conditional mean function of Y can be written as follows:

\[
E(Y|X) = P(Y = 1|X) = \frac{\exp(X^\beta)}{1 + \exp(X^\beta)}
\]

(2)

Where X is a row vector that includes the constant and a group of independent variables that may contribute to the variation of Y. The associated \( \beta \) is a column of coefficient vector. The main reason for selecting the logit function on the right of equation (2) is to ensure that the mapped value is always between zero and one. The second reason for adopting the logit function is that it can be rearranged as the following odds function:

\[
\frac{P}{1 - P} = \exp(X^\beta)
\]

(3)

The left term in equation (3) is interpreted as the odds, and the log odds ratio can be shown as a linear function of the X:

\[
\log \left( \frac{P}{1 - P} \right) = X^\beta
\]

(4)

Equation (4) indicates that one unit change in \( X_j \) would result in an increase in the odds ratio by \( \exp (\beta_j) \). We will use the estimated betas to uncover how the change in each covariate affects the odds ratio of either AMI readmission CV death or all-cause death.

Cox Proportional Hazards Model

Two statistical models are used in this study, including Logistic Regression model and Cox Proportional Hazards model. The Cox Proportional model is similar to Logistic Regression model, yet it also takes the “time to event” and problem of censored data into consideration. The model can be specified as the following:
\[ H(t) = H_0(t) \exp(X^* \beta) \] (5)

In equation (5), \( H(t) \) is defined as the hazard ratio; it is a function of the product of an unspecified baseline function \( H_0(t) \) and the exponential function of the linear vector \( X^* \beta \). Although the term \( H_0(t) \) is unspecified, it can still be estimated using the method of partial likelihood function developed by Cox (1972). According to equation (5), the hazard ratio equals to \( \beta \) if there is an increase of \( x_j \) by one unit. A positive (negative) estimated beta indicates that an increase of one-unit change in \( X \) results in a higher (lower) hazard ratio.

**DATA SOURCE, DATA SPECIFICATIONS, AND DESCRIPTIVE STATISTICS**

The zip-code related median household income data are collected by the U.S. Census and can be retrieved from a commercial website. We collect all the median household income reported for all zip codes in New Jersey. The income variable is then recoded as a categorical variable with four levels. The lowest to highest income level is based on the three quartiles of income data. Income that falls below the first quartile ($43,000) is the lowest level. The second quartile ($55,000) can be used to distinguish the other two income levels. Income that is above the third quartile ($68,000) is the highest level. The empirical distribution of household income data is presented in Figure 1.

The three main response variables and all covariates used for controlling purpose in our statistical analysis are obtained from the Myocardial Data Acquisition System (MIDAS) database. The MIDAS database records all cardiovascular admissions in New Jersey hospitals dated from March 1985 to December 2015. This database is ample in both its cross-section and time dimension. There are total of over thirty periods. We chose a subset of the data based on the following criteria: (1) patients who were below age 18 were excluded. (2) AMI was the primary reason for admission according to the main diagnostic code in ICD-9 (International Classification of Disease 9th edition) billing coding system. (3) The AMI admission took place between 2004 and 2015, and no AMI admission within five years prior to the first AMI. The covariates include both patient’s demographical characteristics and comorbidities. The demographical attributes contain age (> or <= 65), gender, race and ethnicity. The patient’s insurance type (Medicare, Commercial, and Medicaid/Self-Pay/Other) is also included as parts of the demographical inputs. All demographical variables are categorical and their corresponding frequency tables are reported in Figure 2 ~ 6. Comorbidities include the history of acute congestive heart failure (Hchf.acute), chronic congestive heart failure (Hchf.chron), hypertension (Hhyp), diabetes (Hdiab), chronic liver disease (Hcld), chronic kidney disease (Hckd), chronic obstructive pulmonary disease (Hcopd), and disorder of lipid metabolism (Hlipid). All comorbidity variables are binary.

Contingency tables (Table 1 ~ 3) are utilized to provide the interactions of income with some demographical variables. Table 1 and Table 2 indicate that Medicare is the major insurance type for patients under age 65, while Medicaid becomes the dominant insurance for patients age 65 and beyond. The distribution of insurance type does not seem to be affected by the income levels. We also report the relationships between income and three main clinical outcomes in Table 4 to pave the way for more sophisticated data analysis. Table 4 reveals that the proportion of patients readmitted for AMI increases as the income level decreases. However, this pattern is not presented in other two clinical outcomes; the proportions of CV death or all-cause death are about the same in all four income levels.
EMPIRICAL RESULTS

For both Logistic Regression and Cox Proportional Hazards models, we constrain all three clinical outcomes; readmission for AMI, CV death and all-cause death to one year. This constraint allows us to focus on the short-term impacts of the income on these three responses.

Logistic Regression Model

We report the outcomes for both models using figures and tables. According to the Logistic Regression Model, Figure (and Table) 7 ~ 9 reveal how the income variable alone affects each of the three clinical outcomes. Figure 7 shows that, comparing to the highest income level (> 68,000), lower income increase the odds ratio for the AMI readmission. The corresponding Table 5 confirms that all estimates are significant at the 1% level (the p-values are all close to zero). However, this pattern is not as clear-cut when the clinical outcome is either CV death or all-cause death? Figure 8 and 9 indicate that, compared to the highest income level, patients who are at the lowest income (< $43,000) level have a higher risk of CV or all-cause death. Still, patients who are at the other two income levels don’t have higher risk in both clinical outcomes. The statistics from Table 6 and Table 7 confirm this result. We then add all available covariates in the Logistic Regression analysis, and the results (shown in Figure 10 ~ 12) look similar to the ones observed earlier (when the income variable alone was used in the analysis).

Cox Proportional Hazards Model

We adopt the same analytical approach used in Logistic Regression model by including the income variable alone in the Cox model. Figure 13 shows how the hazard ratio of each clinical outcome responds to the income variable level. The corresponding tables (Table 11~13) reveals that while lower income level increases the hazard ratio when the clinical outcome is AMI readmission, the income effect is not significant when the other two clinical outcomes were used as the response variables.

After adding all covariates to the Cox model, we also observe the similar pattern, which may indicate that the effect of income is only significant when the response variable is readmission for AMI. However, the income does not affect the response when CV death or all-cause death is used.

CONCLUSIONS

Our main empirical outcome indicates that income can be a major contributing factor to the chance of AMI readmission among patients with a first AMI admissions. However, the association is not obvious (significant) between income and CV death, or income and all-cause death. Our empirical findings confirm the difficulty to examine the association between socioeconomic status and health outcomes. While the association between income and both CV or all-cause death is not significant, we should carefully conduct further robust tests to ensure the model is well-specified and well-designed. Nevertheless, results from this study help better understand how the income variable affects the chance of risk to be readmitted for potential acute myocardial infarction patients. Cardiovascular disease is the
leading cause of mortality among developing and developed countries. It is essential to understand how the socioeconomic forces are associated with such wide-spread health matters globally. While the mechanism of this association is not determined yet, our findings indicated that the socioeconomic status had a strong negative association with AMI readmission. Once this disadvantaged group of low SES is identified, intervention strategies can be designed to help reduce the chance of such incidence. The health suppliers should pay more attention to these disadvantaged group of patients once they are discharged from their first AMI admission. With the help from policy makers, resources should be allocated to offer these patients follow-up and a continued care plan to reduce possible readmission rates.

REFERENCES


Figure 1

Household Income Distribution in NJ

1st Quartile (Q1) = $43,000
2nd Quartile (Q2) = $55,000
3rd Quartile (Q3) = $69,000

N = 179,520  Bandwidth = 1,485

Figure 2

Gender

Female: 41.03%
Male: 58.97%
Figure 3

Race

- White: 78.44%
- Black: 9.53%
- Other: 12.03%

Figure 4

Ethnicity

- Hispanic: 7.98%
- Non-Hisp.: 81.66%
- Unknown: 10.36%
Figure 5

**Insurance Type**

![Insurance Type Chart]

- Medicare: 51.51%
- Commercial: 41.85%
- Medicaid/Self-Pay/Other: 6.65%

Figure 6

**Age**

![Age Chart]

- < 65: 49.02%
- >= 65: 50.98%
Figure 7

1-Year Risk of Readmission for AMI
(use SES as the Covariate)

Figure 8

1-Year Risk of CV Death
(use SES as the Covariate)
Figure 9

1-Year Risk of All-cause Death
(use SES as the Covariate)

Figure 10

1-Year Risk of Readmission for AMI
(include All Covariates)
Figure 11

1-Year Risk of CV Death
(include All Covariates)

Figure 12

1-Year Risk of All-cause Death
(include All Covariates)
Figure 13

Cox Proportional Hazards Model
(Covariate = SES)

Figure 14

Cox Proportional Hazards Model
(Covariate = All)
Table 1 (Age < 65)

<table>
<thead>
<tr>
<th>Income/Insurance</th>
<th>Medicare</th>
<th>Commercial</th>
<th>Medicaid/Self-Pay/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;$68,000</td>
<td>14560 (86.25%)</td>
<td>1461 (8.65%)</td>
<td>861 (5.10%)</td>
</tr>
<tr>
<td>$55,000–68,000</td>
<td>14554 (80.75%)</td>
<td>2175 (12.07%)</td>
<td>1295 (7.18%)</td>
</tr>
<tr>
<td>$43,000–55,000</td>
<td>14288 (77.06%)</td>
<td>2586 (13.95%)</td>
<td>1667 (8.99%)</td>
</tr>
<tr>
<td>&lt;$43,000</td>
<td>12755 (66.90%)</td>
<td>3879 (20.35%)</td>
<td>2431 (12.75%)</td>
</tr>
</tbody>
</table>

Table 2 (Age ≥ 65)

<table>
<thead>
<tr>
<th>Income/Insurance</th>
<th>Medicare</th>
<th>Commercial</th>
<th>Medicaid/Self-Pay/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;$68,000</td>
<td>4263 (15.68%)</td>
<td>414 (1.52%)</td>
<td>22515 (82.80%)</td>
</tr>
<tr>
<td>$55,000–68,000</td>
<td>4623 (17.99%)</td>
<td>366 (1.42%)</td>
<td>20750 (80.59%)</td>
</tr>
<tr>
<td>$43,000–55,000</td>
<td>4941 (18.27%)</td>
<td>367 (1.36%)</td>
<td>21743 (80.38%)</td>
</tr>
<tr>
<td>&lt;$43,000</td>
<td>4715 (18.12%)</td>
<td>617 (2.37%)</td>
<td>20685 (79.51%)</td>
</tr>
</tbody>
</table>

Table 3

<table>
<thead>
<tr>
<th>Income/Race</th>
<th>White</th>
<th>Black</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;$68,000</td>
<td>37853 (85.89%)</td>
<td>1555 (3.53%)</td>
<td>4666 (10.59%)</td>
</tr>
<tr>
<td>$55,000–68,000</td>
<td>36753 (83.55%)</td>
<td>2499 (5.71%)</td>
<td>4700 (10.74%)</td>
</tr>
<tr>
<td>$43,000–55,000</td>
<td>37080 (81.33%)</td>
<td>3527 (7.74%)</td>
<td>4985 (10.93%)</td>
</tr>
<tr>
<td>&lt;$43,000</td>
<td>28521 (63.26%)</td>
<td>9439 (20.94%)</td>
<td>7122 (15.8%)</td>
</tr>
</tbody>
</table>

Table 4

<table>
<thead>
<tr>
<th>Income</th>
<th>Readmission For AMI</th>
<th>CV Death</th>
<th>All-cause Death</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>&gt;$68,000</td>
<td>4654 (10.56%)</td>
<td>39420 (89.44%)</td>
<td>5814 (13.19%)</td>
</tr>
<tr>
<td>$55,000–68,000</td>
<td>5077 (11.60%)</td>
<td>38695 (88.40%)</td>
<td>5901 (13.48%)</td>
</tr>
<tr>
<td>$43,000–55,000</td>
<td>5391 (11.82%)</td>
<td>40201 (88.18%)</td>
<td>6196 (13.59%)</td>
</tr>
<tr>
<td>&lt;$43,000</td>
<td>5739 (12.73%)</td>
<td>39343 (87.27%)</td>
<td>6185 (13.72%)</td>
</tr>
</tbody>
</table>
Table 5 (Response: Readmission for AMI)

<table>
<thead>
<tr>
<th>Covariate</th>
<th>estimate</th>
<th>lower</th>
<th>upper</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.1181</td>
<td>0.1145</td>
<td>0.1217</td>
<td>0.0000</td>
</tr>
<tr>
<td>$55,000–68,000</td>
<td>1.1113</td>
<td>1.0654</td>
<td>1.1592</td>
<td>0.0000</td>
</tr>
<tr>
<td>$43,000–55,000</td>
<td>1.1359</td>
<td>1.0896</td>
<td>1.1841</td>
<td>0.0000</td>
</tr>
<tr>
<td>&lt;$43,000</td>
<td>1.2355</td>
<td>1.1858</td>
<td>1.2874</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Table 6 (Response: CV Death)

<table>
<thead>
<tr>
<th>Covariate</th>
<th>estimate</th>
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<th>upper</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.1520</td>
<td>0.1478</td>
<td>0.1562</td>
<td>0.0000</td>
</tr>
<tr>
<td>$55,000–68,000</td>
<td>1.0254</td>
<td>0.9863</td>
<td>1.0661</td>
<td>0.2065</td>
</tr>
<tr>
<td>$43,000–55,000</td>
<td>1.0350</td>
<td>0.9959</td>
<td>1.0755</td>
<td>0.0797</td>
</tr>
<tr>
<td>&lt;$43,000</td>
<td>1.0464</td>
<td>1.0069</td>
<td>1.0874</td>
<td>0.0209</td>
</tr>
</tbody>
</table>

Table 7 (Response: All-cause Death)

<table>
<thead>
<tr>
<th>Covariate</th>
<th>estimate</th>
<th>lower</th>
<th>upper</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.2365</td>
<td>0.2310</td>
<td>0.2422</td>
<td>0.0000</td>
</tr>
<tr>
<td>$55,000–68,000</td>
<td>0.9898</td>
<td>0.9570</td>
<td>1.0237</td>
<td>0.5505</td>
</tr>
<tr>
<td>$43,000–55,000</td>
<td>1.0149</td>
<td>0.9817</td>
<td>1.0492</td>
<td>0.3834</td>
</tr>
<tr>
<td>&lt;$43,000</td>
<td>1.0506</td>
<td>1.0163</td>
<td>1.0860</td>
<td>0.0035</td>
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</table>
### Table 8 (Response: Readmission for AMI)

<table>
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<tr>
<th>Covariate</th>
<th>estimate</th>
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<th>upper</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.0754</td>
<td>0.0688</td>
<td>0.0825</td>
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</tr>
<tr>
<td>$55,000–68,000</td>
<td>1.0888</td>
<td>1.0435</td>
<td>1.1361</td>
<td>0.0001</td>
</tr>
<tr>
<td>$43,000–55,000</td>
<td>1.0971</td>
<td>1.0519</td>
<td>1.1441</td>
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</tr>
<tr>
<td>&lt;$43,000</td>
<td>1.1388</td>
<td>1.0905</td>
<td>1.1893</td>
<td>0.0000</td>
</tr>
<tr>
<td>SEX (Male)</td>
<td>1.0216</td>
<td>0.9908</td>
<td>1.0533</td>
<td>0.1708</td>
</tr>
<tr>
<td>AGE (&gt;=65)</td>
<td>1.1249</td>
<td>1.0781</td>
<td>1.1739</td>
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<tr>
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<td>1.1828</td>
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<td>1.0813</td>
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<td>0.0002</td>
</tr>
<tr>
<td>Race(Other)</td>
<td>1.0137</td>
<td>0.9518</td>
<td>1.0796</td>
<td>0.6726</td>
</tr>
<tr>
<td>Race(White)</td>
<td>0.9414</td>
<td>0.8954</td>
<td>0.9898</td>
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</tr>
<tr>
<td>Non-Hispanic</td>
<td>0.9842</td>
<td>0.9315</td>
<td>1.0398</td>
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</tr>
<tr>
<td>Unknown Ethnicity</td>
<td>0.9138</td>
<td>0.8518</td>
<td>0.9804</td>
<td>0.0120</td>
</tr>
<tr>
<td>Hchf.acute</td>
<td>1.0118</td>
<td>0.9692</td>
<td>1.0564</td>
<td>0.5922</td>
</tr>
<tr>
<td>Hchf.chron</td>
<td>1.9238</td>
<td>1.7699</td>
<td>2.0910</td>
<td>0.0000</td>
</tr>
<tr>
<td>Hhyp</td>
<td>1.2250</td>
<td>1.1783</td>
<td>1.2735</td>
<td>0.0000</td>
</tr>
<tr>
<td>Hdiab</td>
<td>1.2503</td>
<td>1.2119</td>
<td>1.2900</td>
<td>0.0000</td>
</tr>
<tr>
<td>Hcld</td>
<td>1.2013</td>
<td>1.0700</td>
<td>1.3488</td>
<td>0.0019</td>
</tr>
<tr>
<td>Hckd</td>
<td>1.4906</td>
<td>1.4255</td>
<td>1.5586</td>
<td>0.0000</td>
</tr>
<tr>
<td>Hcopd</td>
<td>1.0545</td>
<td>1.0186</td>
<td>1.0918</td>
<td>0.0027</td>
</tr>
<tr>
<td>Hlipid</td>
<td>1.1789</td>
<td>1.1435</td>
<td>1.2154</td>
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</tbody>
</table>
### Table 9 (Response: CV Death)

<table>
<thead>
<tr>
<th>Covariate</th>
<th>estimate</th>
<th>lower</th>
<th>upper</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.0537</td>
<td>0.0589</td>
<td>0.0490</td>
<td>0.0000</td>
</tr>
<tr>
<td>$55,000–68,000</td>
<td>1.0345</td>
<td>1.0764</td>
<td>0.9941</td>
<td>0.0952</td>
</tr>
<tr>
<td>$43,000–55,000</td>
<td>1.0310</td>
<td>1.0724</td>
<td>0.9912</td>
<td>0.1285</td>
</tr>
<tr>
<td>&lt;$43,000</td>
<td>1.0479</td>
<td>1.0917</td>
<td>1.0058</td>
<td>0.0254</td>
</tr>
<tr>
<td>SEX (Male)</td>
<td>0.9466</td>
<td>0.9742</td>
<td>0.9198</td>
<td>0.0002</td>
</tr>
<tr>
<td>AGE (&gt;=65)</td>
<td>1.8331</td>
<td>1.9135</td>
<td>1.7561</td>
<td>0.0000</td>
</tr>
<tr>
<td>Medicaid/Self/Other</td>
<td>1.1576</td>
<td>1.2391</td>
<td>1.0815</td>
<td>0.0000</td>
</tr>
<tr>
<td>Medicare</td>
<td>1.2353</td>
<td>1.2852</td>
<td>1.1874</td>
<td>0.0000</td>
</tr>
<tr>
<td>Race(Other)</td>
<td>1.0898</td>
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<td>1.0215</td>
<td>0.0092</td>
</tr>
<tr>
<td>Race(White)</td>
<td>1.1470</td>
<td>1.2066</td>
<td>1.0903</td>
<td>0.0000</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>1.2156</td>
<td>1.2877</td>
<td>1.1475</td>
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</tr>
<tr>
<td>Unknown Ethnicity</td>
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<td>1.0397</td>
<td>0.0024</td>
</tr>
<tr>
<td>Hchf.acute</td>
<td>1.6203</td>
<td>1.6816</td>
<td>1.5611</td>
<td>0.0000</td>
</tr>
<tr>
<td>Hchf.chron</td>
<td>1.9031</td>
<td>2.0558</td>
<td>1.7617</td>
<td>0.0000</td>
</tr>
<tr>
<td>Hhyp</td>
<td>1.1732</td>
<td>1.2177</td>
<td>1.1303</td>
<td>0.0000</td>
</tr>
<tr>
<td>Hdiab</td>
<td>0.9915</td>
<td>1.0220</td>
<td>0.9619</td>
<td>0.5814</td>
</tr>
<tr>
<td>Hcld</td>
<td>1.1831</td>
<td>1.3246</td>
<td>1.0567</td>
<td>0.0035</td>
</tr>
<tr>
<td>Hckd</td>
<td>1.6145</td>
<td>1.6822</td>
<td>1.5495</td>
<td>0.0000</td>
</tr>
<tr>
<td>Hcopd</td>
<td>1.0753</td>
<td>1.1104</td>
<td>1.0413</td>
<td>0.0000</td>
</tr>
<tr>
<td>Hlipid</td>
<td>0.8702</td>
<td>0.8956</td>
<td>0.8455</td>
<td>0.0000</td>
</tr>
</tbody>
</table>
Table 10 (Response: All-cause Death)

<table>
<thead>
<tr>
<th>Covariate</th>
<th>estimate</th>
<th>lower</th>
<th>upper</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.0692</td>
<td>0.0750</td>
<td>0.0638</td>
<td>0.0000</td>
</tr>
<tr>
<td>$55,000–68,000</td>
<td>0.9934</td>
<td>1.0291</td>
<td>0.9590</td>
<td>0.7143</td>
</tr>
<tr>
<td>$43,000–55,000</td>
<td>0.9968</td>
<td>1.0322</td>
<td>0.9627</td>
<td>0.8589</td>
</tr>
<tr>
<td>&lt;$43,000</td>
<td>1.0233</td>
<td>1.0611</td>
<td>0.9870</td>
<td>0.2114</td>
</tr>
<tr>
<td>SEX (Male)</td>
<td>0.9300</td>
<td>0.9539</td>
<td>0.9068</td>
<td>0.0000</td>
</tr>
<tr>
<td>AGE (&gt;=65)</td>
<td>2.1816</td>
<td>2.2664</td>
<td>2.0999</td>
<td>0.0000</td>
</tr>
<tr>
<td>Medicaid/Self/Other</td>
<td>1.1396</td>
<td>1.2127</td>
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<td>0.0000</td>
</tr>
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<td>1.3509</td>
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</tr>
<tr>
<td>Race(Other)</td>
<td>0.9881</td>
<td>1.0464</td>
<td>0.9330</td>
<td>0.6820</td>
</tr>
<tr>
<td>Race(White)</td>
<td>1.1078</td>
<td>1.1580</td>
<td>1.0597</td>
<td>0.0000</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>1.2633</td>
<td>1.3298</td>
<td>1.2001</td>
<td>0.0000</td>
</tr>
<tr>
<td>Unknown Ethnicity</td>
<td>1.1653</td>
<td>1.2414</td>
<td>1.0939</td>
<td>0.0000</td>
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<tr>
<td>Hchf.acute</td>
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<td>1.7553</td>
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<td>1.2019</td>
<td>1.1255</td>
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<td>1.0815</td>
<td>1.1107</td>
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<td>0.0000</td>
</tr>
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<td>1.5100</td>
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Table 11 (Response = Readmission for AMI, Covariate = SES)

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Table 12 (Response = CV Death, Covariate = SES)

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Table 13 (Response = All-cause Death, Covariate = SES)

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Table 15 (Response = CV Death, Covariate = ALL)

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Table 16 (Response = All-cause Death, Covariate = ALL)

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</table>

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ABSTRACT

We investigated whether Intermediate Accounting students should be exposed to negative views/opinions about accounting and the accounting profession. We solicited the opinions of current Intermediate Accounting students and recent accounting interns, staff accountants with two to three years’ experience, and CPA firm managers and partners. Four negative statements and a positive statement about accounting and the accounting profession were presented. Our results were mixed across the negative statements presented. The comments received from the manager/partner group tended to indicate they felt the undergraduates lacked sufficient understanding to fully comprehend the impact of some of the negative statements.

INTRODUCTION

Accounting professors and/or the university’s Accounting Society/Beta Alpha Psi groups walk a fine-line concerning whether to expose accounting majors to the bad and ugly side of accounting and the accounting profession. We believe many, if not most, accounting professors strongly support and positively promote the accounting major as superb educational preparation for virtually any business career. However, do we (or should we) equally share with students the dark side of the profession – those items that criticize accounting and the accounting profession? How will students enrolled in Intermediate Accounting courses react to hearing these negative criticisms? How will the accounting firms respond to professors discussing the bad and ugly side of GAAP and the accounting profession with their students?
We solicited the opinions of three groups: Intermediate Accounting students and recent accounting interns, staff accountants with two to three years’ experience, and CPA firm managers/partners. Each of the groups was asked to respond to criticisms of Generally Accepted Accounting Principles (GAAP) and the accounting profession:

1. Depreciation (duh-precipitation)
2. The Financial Accounting Standards Board (Reducing Complexity - The Latest Red Herring from the FASB)
3. LIFO inventory costing method (Lie-Fo)
4. The accounting profession (Auditing Armageddons)

We asked each of the groups surveyed the extent to which each of the negative statements should, or should not, be presented and discussed in Intermediate Accounting classes. Following the four negative statements, we presented a positive statement about the very high rating accountants received on integrity and then asked if the inclusion of the positive statement along with the negative statements would have altered their responses. The survey instrument can be found in Appendix 1 at the end of this paper.

SURVEY Statements AND RESULTS

The four negative statements as well as one positive statement used in the survey, including statistical results and brief commentary, are presented in the following sections.

Negative Statement #1: “Duh-precipitation: Why Is This Elephant Still In The Room?”

“Why are modern accounting principles still systematically depreciating assets? Why are regulators and standard-setters oblivious to depreciation’s glaring flaws, while they quibble with less significant issues? For nearly two centuries, accountants have reported duh-preciable assets at original cost less accumulated duh-precipitation. Millions of users and commentators (and accounting professors and students) behave as if the resulting “book value” actually describes something real. Duh-precipitation is nothing but a made-up number that has no correlation with any real event, and it leaves significant and abundant havoc in its wake. Is it any wonder that stock prices and accounting numbers show so little correlation.” Miller and Bahnson (2010)

The results of the single factor ANOVA for Negative Statement One are shown in Table 1. For the ANOVA tests, it is assumed that (a) the samples have been independently selected; (b) the three populations are normal; (c) the population variances are equal; and (d) data was considered quantitative.

Since there was a significant difference in the mean responses (scores) among the three groups, a Tukey-Kramer Multiple Comparison procedure was done. These results show that while the current student/interns and the staff accountants with two to three years’ experience do not differ in their opinion on ‘not presenting and discussing duh-precipitation’, the manager/partner group felt it should be presented at the Intermediate Accounting level.
A possible reason for the student/intern and staff accountant groups responding to not present or discuss duh-preciation is that these two groups are still looking for the correct answer when it comes to depreciation being shown on the financial statements. The manager/partner vote for having the presentation and discussion of duh-preciation could be based on their view that the movement to fair value may make traditional depreciation less significant. But in order to understand this differentiation, the discussion of duh-preciation needs to take place in Intermediate Accounting.

As indicated on the survey instrument in Appendix 1, we included a request for respondents to include any comments they found applicable to the statement being considered. Two such comments we received in relation to Negative Statement One seem appropriate to whether or not to present and discuss duh-preciation in the classroom:

1. Manager/partner: “I think discussing these types of topics in the classroom would be very helpful for students preparing to go into the working world. One of the biggest things I have encountered in my career is that in the real world, the first question people seem to ask is why to do something instead of the how to do something. The how do it approach, (not the why approach) is usually required in the classroom. Although these are negative topics, and the why could be confusing, I think discussing them would be a huge advantage for students to understand what they are getting into and more fully test their understanding of accounting.”

2. Manager/partner: “…… When you enter the workforce right after school it is quite shocking since what we learn in the classroom is so differently used/applied in the actual work we do. I think giving students this ‘real/work life’ perspective as undergraduates could benefit them when they graduate.”

Negative Statement #2: “Reducing Complexity – The Latest Red Herring From the FASB”

“If accounting standards are unclear, it’s probably because they were meant to be just that. Over time, the FASB generously spiced its pronouncements with slippery notions of management intent, pretentious terminology, and gaps in procedures. The un-acknowledged elephant in the room is the costs borne by investors from value-destroying decisions made by management to achieve an artificial accounting result. If an accounting rule looks fishy, then management is probably abusing it……” Selling (2014)

The ANOVA result for Negative Statement Two is shown in Table 2. No significant difference existed in the mean responses among the three groups at the .05 level of significance. It did not appear that any of the three groups felt strongly as to whether the negative statement concerning complexity should be discussed in Intermediate Accounting.

The results in Table 2 are not what we had anticipated. We expected the student/intern group to want to discuss a way to decrease the complexity issues in GAAP. Our personal observations have been that many students feel they are expected to learn an inordinate amount of detailed accounting rules, so a discussion of a way to reduce GAAP’s complexity would be desired. We further expected the staff and manager/partner groups would support a discussion on complexity since they understand that one rule does not fit every situation. While we thought all groups would favor a discussion on reducing complexity, the results indicated all groups were indifferent on having such a discussion in Intermediate Accounting.
We received two interesting comments that addressed the question of complexity:

1. Manager/partner: “I personally think that students should be exposed to controversial topics in the classroom and understand both sides of the argument. While I have a lot of thoughts on reducing complexity, I selected ‘not’ for this one as I am not sure students (who don’t really have an appreciation yet for how complex certain areas are) would get the issue. I could be wrong about that though.”

2. Staff accountant: “I think it’s a good idea to present questions such as these in an Intermediate Accounting class. During my first few years working in public accounting, I’ve found that one needs to be able to develop critical thinking skills by discussing questions such as this in order to become a better advisor to our clients. Introducing these topics in the classroom would enable students to start thinking not just in terms of debits and credits, but to start thinking more as a business advisor.”

Negative Statement #3: “Taking The Lie Out Of Lie-Fo”

“We have come to realize that it’s long past time to question using LIFO. It has survived since it entered both the Federal Tax Code and GAAP in 1939, which means it’s been around longer than most everyone reading these words. That longevity gives LIFO a spot on the Hall of Fame roster of POOP – Pitifully Old and Obsolete Principles.

LIFO LIÉS: Because the Lie-Fo amount for inventory is presented on GAAP balance sheets, then it surely must be useful information. In fact, the Lie-Fo amount does not provide any relevant and reliable information about inventory because it is a preposterous amalgamation of original costs of items that the company no longer owns. Although it doesn’t faithfully represent anything, its use on the balance sheet clearly signals that the accounting and management professions (including FASB) are content to report useless amounts….” Miller and Bahnson, (2013)

ANOVA results for Negative Statement Three are shown in Table 3. We found that a difference among the mean responses of the three groups did exist. The results showed no significant difference between the student/interns and the staff accountants groups’ vote in favor of not presenting and discussing Lie-Fo. However, the same cannot be said of the manager/partner group who felt Lie-Fo should be presented and discussed in Intermediate Accounting.

One possible explanation for the responses by the student/intern and staff accountants’ groups to not present and discuss Lie-Fo is that these younger groups may see LIFO as a viable option under GAAP and have come to understand the tax implications. Also, given that IFRS does not allow the use of LIFO, it seems possible that students and staff did not feel a discussion of this topic would be relevant.

Based on their responses, the managers/partners appeared to believe that a fuller, more robust discussion of the impact of LIFO would be appropriate in Intermediate Accounting – rather than just teaching students how to compute a dollar amount. One comment from the open-ended portion of the survey seems to be relevant for this statement (and really all statements):

Manager/partner: “I think it is important to present all sides of the discussion on the opportunities, challenges, influences, and obstacles we face in the accounting profession at the initial phase of shaping future Accountants. I also think ….. insufficient focus is placed on the need of accountants to develop well rounded critical thinking skills and deep business
acumen within our clients’ industries to best serve client needs and the needs of the capital markets.”

**Negative Statement #4: “Auditing Armageddons”**

“The most telling moment of the Senate Subcommittee’s hearing on “The Role of the Accounting Profession in Preventing Another Financial Crisis” was the Chairperson of the PCOAB unequivocal acknowledgement that auditors should have delved deeper into valuation, going concern, and end-of-period issues before issuing their clean opinions on financial institutions that ultimately disintegrated in one way or another. There is no getting around the fact that audit failures played a significant role in the financial crises.....

Nothing less than a fundamental reassessment of the role of auditing and auditors in public company financial reporting can begin to accomplish what is needed after the three auditing Armageddons in three decades: the S&L crisis, Enron et al., and the financial crisis. Stated bluntly, history should have taught us by now that auditors might be good at verification of things which are capable of being verified, and very little else.” Selling (2011)

The results for Negative Statement Four are shown in Table 4. We found no significant differences to exist among the mean responses of the three groups at the .05 level of significance.

We expected there would be a difference among the groups in the presentation and discussion of this negative statement about the profession. Specifically, we thought the manager/partner group would not want this discussed in Intermediate Accounting as it might cause students to rethink their decision to go into accounting -- both as a major and as a profession. We were personally pleased to see that all three groups (including the manager/partner group) seemed to agree that an open and frank discussion of what accountants can and cannot do with regard to the presentation of the financial statements represents a potentially healthy discussion.

Three comments from the open-ended portion of the survey seemed to be applicable:

1. Staff accountant: “Since a good number of accounting major graduates go into public accounting, I think discussing negative statement #4 is very, very relevant to what they will hear and experience in public accounting.”

2. Manager/partner: “Negative Statement Four is very interesting. I don’t entirely agree that the auditors had a major role to play in the third ‘Armageddons,’ but I do believe that many would like to re-write the rules so that we can be blamed next time! I am supportive of a project to better define the role of the auditor and if that gets expanded, that’s fine, but let’s make sure everyone understands what it is and just as importantly what are the costs?”

3. Manager/partner: “Talking about the practical/controversial aspects of accounting would be very refreshing and something I would have loved to have heard back in the day. I think it helps bring to life what the profession is really like and the opportunities and challenges we continue to face. Although I have little to do with audits these days, I'm not immune to the continued discussion that takes place within my Big 4 firm.”

**Positive Statement “Accounting Firms Most Trusted”**

After the four negative statements, a positive statement about accounting firms’ high ranking on trustworthiness was presented. PICPA Professional Issues Update. (2015). We asked the survey participants if their responses to the four negative statements would have
been different if the professor presented and discussed the positive statement on accounting firms’ ‘very high ranking on trustworthiness’ in conjunction with the negative statements.

We believe accounting educators and professionals at all levels: students, student interns, staff accountants, and managers/partners already support the accounting profession, therefore we did not expect the addition of a positive statement would have an impact on survey responses to the negative statements.

Table 5 summarizes the participants’ responses to the Positive Statement.

The survey results show a significant difference at the .05 level when staff accountants with two to three years’ experience responses are compared to both the student/intern group and the manager/partner group. While we would like to offer a reason for these unexpected results, we are unable to suggest an explanation.

In addition, none of the comments received from the open-ended part of the survey appeared to address why the staff accountants’ responses differed from the other two groups. However, this does offer the opportunity to expand our study to address this specific result.

CONCLUSION

We believe the results of our study will have an impact on how accounting professors address controversial topics when teaching Intermediate Accounting. Given the survey responses we obtained, in our opinion both the positives and the negatives about accounting and the accounting profession should be addressed inside the classroom. Students appear to want to hear the good, the bad, and the ugly, and not just be told about the positives within the discipline. Our study suggests that practicing professionals, whether staff accountants with two to three years’ experience, or at the manager/partner level, also generally feel that all aspects of the accounting environment should be presented as early as the Intermediate Accounting course.

We are unsure whether administrators at various colleges and universities would view the inclusion of negative statements as desirable in a course such as Intermediate Accounting. Will a departmental chair (or other accounting faculty not currently teaching Intermediate) be concerned if the inclusion of the bad and the ugly aspects of accounting and the accounting profession might decrease the number of students selecting accounting as a major? If so, would that fact have an impact on staffing decisions? Would upper level administrators be concerned that a decrease in accounting majors may ultimately impact placement rates for undergraduates?
### TABLE 1: STATISTICAL ANALYSIS OF STATEMENT #1:
### DUH-PRECIPATION: WHY IS THIS ELEPHANT STILL IN THE ROOM?

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<td>Total</td>
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<tr>
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**TABLE 2: STATISTICAL ANALYSIS OF STATEMENT #2:**
REDUCING COMPLEXITY – THE LATEST RED HERRING FROM THE FASB

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<td>56</td>
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<td>2.3929</td>
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<td>Managers/Partners</td>
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<td>Within Groups</td>
<td>104.1349</td>
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Level of significance .05
**TABLE 3: STATISTICAL ANALYSIS OF STATEMENT #3:**

**TAKING THE LIE OUT OF LI-FO**

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**TUKEY-KRAMER**

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<tr>
<td>Denominator d.f.</td>
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<td>MSW</td>
<td>0.5295</td>
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<tr>
<td>Q statistic</td>
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### TABLE 4: STATISTICAL ANALYSIS OF STATEMENT #4:
**AUDITING ARMAGEDDONS**

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<td>Staff Accountants</td>
<td>56</td>
<td>160</td>
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<td>Managers/Partners</td>
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<td>143</td>
<td>2.9184</td>
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<th>P-value</th>
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<td>0.2250</td>
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<td>Within Groups</td>
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<td>0.1970</td>
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Level of significance 0.05
### TABLE 5: STATISTICAL ANALYSIS OF POSTIVE STATEMENT

**ACCOUNTING FIRMS MOST TRUSTED**

<table>
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<th>Group</th>
<th>Count</th>
<th>Sum</th>
<th>Average</th>
<th>Variance</th>
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<tbody>
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<td>245</td>
<td>2.3820</td>
<td>0.3297</td>
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<td>162</td>
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<td>Managers/Partners</td>
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<td>120</td>
<td>2.1224</td>
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<th>F</th>
<th>P-value</th>
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<td>0.3362</td>
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</tbody>
</table>

**Level of significance** 0.05
FIGURE 1:

ACCOUNTING FIRMS MOST TRUSTED

Accounting Firms Most Trusted

- Accounting Firms
- Banks
- Investment Firms
- Health Ins. Co.
- Mortgage Companies
- Gov’t regulators
- Credit Card Co.

Pennsylvania Institute of Certified Public Accountants
APPENDIX – SURVEY INSTRUMENT

Please read each of the five (5) separate statements that follow [Only the first statement is presented below. The remaining four statements are presented within the paper and are not repeated here]. Select for each statement your opinion from the following answer choices on whether the statement should be presented and discussed in an Intermediate Accounting class. Your comments are solicited and the end of the survey.

The answer choices are -
1 – I DEFINITELY do NOT want an Accounting professor to present and discuss this statement in an Intermediate Accounting class.
2 – I PREFER that an Accounting professor NOT present and discuss this statement in an Intermediate Accounting class.
3 – I do not have a preference whether or not an Accounting professor presents and discusses this statement in an Intermediate Accounting class.
4 - I PREFER that an Accounting professor DOES present and discusses this statement in an Intermediate Accounting class.
5 - I DEFINITELY PREFER that an Accounting professor present and discusses this statement in an Intermediate Accounting class.

STATEMENT #1 is related to the Depreciation Chapter in Intermediate Accounting: “Duh-depreciation: Why is this elephant still in the room?”

“Why are modern accounting principles still systematically depreciating assets? Why are regulators and standard-setters oblivious to depreciation’s glaring flaws while they quibble with less significant issues? For nearly two centuries, accountants have reported duh-depreciable assets at original cost less accumulated duh-depreciation. Millions of users and commentators (and accounting professors and students) behave as if the resulting “book value” actually describes something real. Duh-depreciation is nothing but a made-up number that has no correlation with any real event, and it leaves significant and abundant havoc in its wake. Is it any wonder that stock prices and accounting numbers show so little correlation?”

Please place an “X” on the blank line preceding the number below that in your opinion best describes whether the above statement on Depreciation should be presented and discussed in Intermediate Accounting.

_____1 – I DEFINITELY do NOT want this topic presented and discussed in an Intermediate Accounting class.
_____2 – I PREFER that this topic NOT be presented and discussed in an Intermediate Accounting class.
_____3 – I do not have a preference whether or not this topic is presented and discussed in an Intermediate Accounting class.
_____4 - I PREFER that this topic DOES get presented and discussed in an Intermediate Accounting class.
_____5 - I DEFINITELY PREFER that this topic is presented and discussed in an Intermediate Accounting class.
PLEASE feel free to add any comments on the next sheet. We thank you for completing the survey and providing your comments! Send your completed survey via email attachment.

REFERENCES

EXPLOITATION, EXPLORATION, DEVELOPMENT AND DECAY OF RESOURCES: A SYSTEMIC VIEW

Jeffrey Yi-Lin Forrest
Slippery Rock University

Yong Liu
Jiangnan University

Eric Swift
Slippery Rock University

Tooraj Karimi
University of Tehran

ABSTRACT

Riding on the increasing importance of the resource-based theory of the past decade in the research of management and marketing, this work develops a cohesive theory of resources based on several basic assumptions by employing the thinking logic of systems science. In particular, this paper establishes definite results on the exploitation and exploration of resources; firm’s technological opportunism, innovativeness, and performance; development, interactions, and decay of resources; and conditions under which a firm would fail to consistently exploit its available resources. Because all the conclusions established herein are developed through logical reasoning, their truthfulness is not affected by any of the constraints and uncertainties of data mining; and they are expected to be universally applicable in practice.

INTRODUCTION

For the purpose of predicting the future, various methods of science and mathematics have been practically tried throughout the history, although not much progress has been made in terms of prediction accuracy and reliability (Lin & OuYang, 2010). Parallel to such attempts in science, in the past nearly twenty years scholars in areas of management science and marketing have been looking at the concept of resources with increasing interest and intensity, hoping that by using this concept one will be able to explain and predict the bases of a firm’s competitive advantage and performance (Kozlenkova, et al., 2014; Crook, et al., 2008). During this time frame, scholars have piled a good number of discoveries and theories, most of which are either explicitly or implicitly established on summarizing anecdotes or mining data. However, scientifically speaking, such discoveries and theories in general suffer from severe constraints and uncertainties inherently existing in any kind of data collection, coding, and analysis. This fact explains why any business decision that involves the slightest amount of prediction of the future tends to be not reliable (Lin & OuYang, 2010).
Targeting this weakness of the literature, where management and marketing issues have been carefully investigated by utilizing the resource-based theory, this work attempts to develop a cohesive theory of resources for firms based on what has been established in the past decades since the time when Penrose (1959) initially identified the importance of organizational resources to a firm’s success. In order to avoid all the uncertainties and constraints inherently existing in summaries of anecdotes and collections, coding, and analyses of data, we will develop the general theory by applying the holistic thinking logic and methodology of systems science. Because of this reason, all the established results in this paper are expected to be generally true and can be practically employed in real-life business decision making.

More specifically, this paper employs the systems thinking (Lin, 1999) as the logic of reasoning and the systemic yoyo model (Lin, 2009) as the intuition for how organizations operate and how organizations interact with each other. On such a methodological basis, this work is able to develop general results on such important issues as when a firm is likely or certainly to develop sustainable competitive advantages, how the capability-rigidity paradox can be avoided, what could potentially improve firm performance, how relational resource impacts the innovativeness of the firm, when interactions of resources could lead to undesirable effects, when and how a capability would evolve or cease to exist, when a firm would fail to consistently exploit its resources, among others.

The rest of this paper is organized as follows: The next section reviews the relevant literature and explains how this paper contributes to what is known, followed by a section that introduces the history and the basic logic of thinking of systems science. After laying down the most fundamental properties of resources, the following sections respectively looks at issues regarding the exploitation and exploration of competence, technological opportunism and innovativeness of firms, interactions of resources, the development and decay of resources. Then we analyze when a firm would fail to exploit its resources. This presentation is concluded in the last section.

LITERATURE REVIEW

It is in as early as the late 1950s that Penrose (1959) first shows how important organizational resources are to the success of firms. After a quiet period of dormancy, the well-known resource-based view of the firm started to take shape in the 1980s (Porter, 1979; Wernerfelt, 1984). Then many scholars, such as Barney et al (2011), Crook et al (2008), Kozlenkova et al (2014), Slotegraaf et al (2003), Vorhies and Morgan (2005), and others, demonstrate the importance of the concept of resources and the resultant resource-based theory. Specifically, the importance of the concept of resources stems from the fact that it offers a framework for integrating multiple, dissimilar resources to explain their synergistic, differential effects on firms’ performance and the contingencies associated with each effect (Fang, et al., 2011), which happens to coincide with the capability of systems science and systems methodology. That is the exact background reason for why we think about using systems science and its methodology to develop the desired general theory of resources.

In terms of competitive advantages, Lages et al. (2009) consider the relationship between organizational learning and relational capabilities and product innovation and quality. They find that the learning capability boosts product innovation, while relational capability improves product quality, innovation and relationship capabilities increase economic performance. Considering how advantages and resources interact with each other,
Kaleka (2011) finds that service advantage helps to increase the performance of export venture, while product development and customer relationship capabilities enhance service advantage, that customer relationship and informational capabilities help enrich experiential resources, and that product development and informational capabilities are improved by financial resources. Vorhies and Morgan (2005) find evidence for benchmarking of marketing capabilities as a tool for enhancing capabilities that drive the development and implementation of sustainable competitive advantages. In his study of the creation of competitive advantages, Jap (2001) claims that bilateral idiosyncratic investments help the creation of competitive advantages, while ex-post opportunism erodes competitive advantages; this negative effect can be lessened by idiosyncratic investments, goal congruence, and interpersonal trust. Considering how to evaluate and (re)develop strategic initiatives that put into place operational capabilities to provide new sources of firm-level competitive advantage, Liu and Liang (2015) explore the practical intersection of operations management and strategy from resource-based view. These authors develop a theoretical approach to integrate the core factors that determine the performance of operational competitiveness, followed by a case study.

As for firm performance, Li and Calantone (1998) examine firms’ processes that comprise market knowledge competence, which helps increase new product advantages that in turn improve the market performance of the product. It is found (Zou, et al., 2003) that export marketing capabilities affect indirectly the performance of the export venture through low-cost and positional advantages of brands, while the development, distribution and communication of new products improve the positional advantage of export venture, which in turn helps to raise the financial performance. Ruiz-Ortega and García-Villaverde (2008) reveal that for pioneers, all capabilities improve firm performance with marketing capabilities doing so the most; for early followers, management and technical capabilities improve performance; and for late followers, technical and marketing capabilities help performance. Slotegraaf and Dickson (2004) recognize that marketing planning capability exerts a curvilinear effect on firm performance. In studying what improves the development of unique products, Ramaswami et al (2009) find that customer management exerts the strongest impact on firm performance. Lonial and Carter (2015) suggest that each of market, entrepreneurial, and learning orientations can enhance company success, but their individual potential should not be viewed in isolation by looking at these three orientations as capabilities of small and medium-sized enterprises on the basis of the resource-based view of the firm.

In terms of resources and market deployment, Slotegraaf et al (2003) maintain that the level of intangible marketing and technological resources is positively correlated to the effectiveness of market deployment, such as distribution and coupon activity, while the level of financial resources is negatively correlated to the effectiveness of market deployment. Hughes et al. (2010) find that investments in marketing differentiation strategy generate the necessary strategic incentive to form innovation ambidexterity, which in turn determines both marketing differentiation and cost leadership advantages, and that both marketing differentiation and cost leadership advantages improve the performance of export venture. In terms of how an advantage could turn into a disadvantage, Boulding and Christen (2003) find that pioneering firms tend to experience an initial profit advantage for a period of time of about 12 – 14 years, after which early entry turns into a profit disadvantage when compared to later entrants.
Atuahene-Gima (2005) demonstrates that market orientation simultaneously empowers exploitation of existing innovation competencies and exploration of new innovation competencies. Luo et al. (2004) establish that customer relationships and business partner social capital help sales growth and return on investment with the former being the main driver behind firm performance, that governing-agency social capital helps sales growth but not return on investment. It is shown that social capital is correlated with higher economic income (Tomer, 2003). Entrepreneurs who possess stronger human capital and broader social networks are more effective networkers (Wright, at el., 2009). Wright et al (2009) and Baron and Markman (2003) indicate the importance of social capital and human capital in entrepreneurs’ success. In addition, other authors connect social capital to entrepreneurship. For example, Aldrich and Zimmer (1986) suggest that social ties and social network diversity broaden the scope of opportunities for entrepreneurs and that increased connectedness increases the flow of information as well as resource availability.

Richey et al. (2010) analyze what affects the financial performance of B2B partnerships, and realize that for data storage resources but not for communication or customization resources there are resource complementarities. In their investigation of what capabilities have direct and complementary effects on revenue and margin growth, Morgan et al. (2009) find that customer relationship management capability lowers revenue growth rate while increases margin growth. Considering the fact that dynamic capabilities are sometimes inadequate for dealing with urgent and unexpected organizational and strategic problems, Ritalam et al (2016) explore the boundary conditions of dynamic capabilities and proposes a complementary approach for dealing with unfamiliar problems: the ad hoc problem-finding and problem-solving perspective, accompanied by a series of theory-driven propositions to illustrate their arguments. Looking at how company size affects the effectiveness of investments in marketing and innovation capabilities on firm performance, Jeng and Pak (2016) analyze a sample of 692 small, medium, and large enterprises. They find that large firms prospered from building dynamic capabilities under the condition of high industry competitiveness, investments in innovation and marketing individually diminished small firms’ performance, and the effect was mixed for medium-size firms.

By using a specific type of strategic resource – commitment-based human resource systems, Chadwick et al (2015) examine the effect of CEO resource orchestration in a multi-industry sample of 190 Korean firms. They demonstrate that CEO emphasis on strategic human-resource management is a significant antecedent to commitment-based human-resource systems and carries primary effects on firm performance. By looking at the phenomenon of interlocking directorates, Zona et al (2016) suggest that such phenomenon may exert either a positive or a negative effect on subsequent firm performance, depending on the firm’s relative resources, power imbalance, ownership concentration, and CEO ownership. And this hypothesized effect is positively supported by a sample of 145 Italian companies. Studying the influence of the dynamic capabilities on firm’s performance, Arifiant and Frmanzah (2015) propose that technology adoption is a functional competence/capability that mediates the relationship between dynamic capabilities and firm’s performance by identifying four determinant factors: externalities, entrepreneurial leadership, slack resources, and absorptive capability. By using a sample of 1671 firms operating in four countries, Covin et al (2016) look at what drivers of innovativeness could be common to family and non-family firms. These authors reveal six configurations of behavioral proclivities and/or resources that predict radical innovativeness. Fuentes-Fuentes et al (2017) investigates the relationship between business contacts and innovativeness in
women-owned firms by using a sample of 107 women entrepreneurs in Spain. They show that maintaining close contacts with managers/entrepreneurs in different industries and with customers is significant in explaining innovativeness in women-owned firms. By considering how to theoretically incorporate factors external to the organization into the business process management lifecycle through dynamic capabilities, Bernardo et al (2017) find that dynamic capabilities contribute to the conceptualization and understanding of business process management, assist in the process of organizational change by promoting adaptation to the environment, and enhance business process management performance.

Compared to the literature, this work employs the thinking logic and methodology of systems science instead of empirical means to establish a few general results that can be applied in business decision making with reliability and certainty. In particular, some of the most important results developed herein include, among others: (1) If a resource (or a set of resources) a firm controls is simultaneously valuable, rare, and exploitabile by the firm, then the firm will be able to design and implement a sustainable competitive advantage out of the resource; (2) If a resource or a set of resources of a firm is simultaneously valuable and rare, and if the managers’ interests are aligned with those of shareholders, then the resource will result in a sustainable competitive advantage for the firm; (3) Market orientation of a firm and its capability to act accordingly enable the firm to resolve the capability-rigidity paradox, and consequently helps the firm to sustain its competitive advantage that in turn means superb performance; and (4) for two opposing business goals A and B, any interaction between resources that lead to the realization of goal A and those that help actualize goal B tends to produce undesirable effects.

Speaking differently, the contribution of this work to the literature is of the following two folds: one is its introduction of a brand new thinking logic and methodology into the study of various management and marketing issues based on the resource-based view; the other is the actual establishment of widely applicable results in real life.

A BRIEF INTRODUCTION TO SYSTEMS SCIENCE

To help with the understanding of the logical reasoning provided in rest of this paper, let us in this section introduce the relevant basics of systems science and the systemic yoyo model for each and every system.

When the elements within a set of things are associated with each other to accomplish certain goal(s), the totality of the elements and their relationships is referred to as a system. The key that turns the set of elements into a system is the collections of all the relations that associate the elements one way or another; and because of these relations, the system is not a so-called trivial system, where the set of relations is empty (Lin, 1999). From this definition of systems, it can be seen that systems are everywhere, especially in investigations of economic issues and business decision making. For instance, each person is a system that is made up of many smaller biological parts connected in various ways. And, the person belongs to, as a member, many large-scale systems, such as a family, neighborhoods, communities, etc. Beyond that, the person also interacts with a range of different systems, such as an automobile, a bank’s ATM machine, a computer, retail stores, etc. Through many of such individuals, we get the feeling that these systems actually interact constantly with each other. An important takeaway from this analysis is that in scholarly studies other than employing methods and the thinking logic developed on the basis of numbers and variables,
which is what is mostly done in the literature of scholarly works, what is urgently needed is
the concept of systems and related methodology. This end is especially true when we have
to investigate problems and issues of business and economics, because in these studies
involved are mostly about organizations (or systems) and how organizations interact with
each other (or interactions of systems). Additionally, from this analysis, it can be expected
that results and conclusions produced out of such holistic way of thinking and related
methodology would be more reliable when applied to make business decisions.

In terms of history, theories of various systems can be traced back as far as the recorded
human history goes. And the concept of systems has been explicitly or implicitly introduced
by scholars in different disciplines. However, the well-known systems science, as an
organized systematic investigation of systems in general, has only appeared in the last ninety
some years. Although it is still a quite new area of scholarly exploration, its importance has
been recognized in different fields of study. For example, Rostow (1960) in economics wrote
that:

The classical theory of production is formulated under essentially static assumptions …
to merge classical production theory with Keynesian income analysis … introduced the
dynamic variables: population, technology, entrepreneurship, etc. But … do so in forms so
rigid and general that their models cannot grip the essential phenomena of growth … We
require a dynamic theory … which isolates not only the distribution of income between
consumption, savings, and investment (and the balance of production between consumers
and capital goods) but which focuses directly and in some detail on the composition of
investment and on developments within particular sectors of the economy.

In biology von Bertalanffy (1924) points out that

because the fundamental character of living things is their organization, the customary
investigation of individual parts and processes cannot provide a complete explanation of the
phenomenon of life.

Additionally, many other scholars, such as, for example, Porter (1985), Klir (1985), Lin
(2009), etc., also show how powerful holistic thinking and relevant methodology could be
when they are employed to produce realistically dependable and practically usable
conclusions regarding organizations. In other words, business agencies of different
magnitudes and scales, economies of various sizes, and markets of whatever kinds truly and
realistically interact with each other. And most of these economic entities need to be
investigated by using the concept of systems and related methodology in order to produce
practically usable conclusions. As a matter of fact, since the 1920s when von Bertalanffy
(1924) first pointed out the importance of organizations in the understanding of the
phenomenon of live, such a holistic view of nature, organizations, and social events has
permeated the entire spectrum of knowledge, see (Lin, 2009) and references found there for
details on how specific areas of learning have benefitted.

The essential difference between the concept of numbers and that of systems can be
traced to how these concepts are formulated. Although they are all abstracted out of the
physical world, they are conceptualized from two different angles. In particular, when an
economic entity is treated as a collection of unrelated elements, such as people and
properties, numbers come into play, such as n employees, m copy machines, etc. Such
treatment of the economic entity in fact divides the holistic being of the organization into
pieces without considering the relationships between the component pieces. However, to
truly understand how the economic entity operates and how it interacts with other entities,
we have to look at the economic entity as a whole consisting of the component pieces and
their organic connections. That is, when the economic entity is seen holistically, the concept of systems emerges, where such elements as employees, capital, properties, etc., make up of an organic totality through relationships. Without these relationships the economic entity does not exist. In other words, all studies in business-related disciplines are essentially about relationships of one kind or another (or systems), be they firms of different magnitudes, markets of various kinds, industries of diverse economic coverage, or economies that occupy dissimilar geographical areas.

To summarize, the concept of numbers and that of systems are different in the following two main ways:
1) Numbers represent a small scale local concept, while systems a large-scale organizational, structural concept (Lin, 1988; 1999); and
2) Numbers emerge and get collected only post existence, while systems appear at the same time when the underlying physical or intellectual existence comes into being (Lin, 2009).

That is the very reason why methodologies of systems science are more appropriate than all theories developed on numbers and variables for the investigation of economic entities when their internal structures are concerned with; and that has been the reason why the Wall Street still cannot successfully make advanced predictions for imminent economic disasters, see (Lin & OuYang, 2010) for more in-depth explanation.

When the totality of all studies of various kinds of systems is concerned with, we have the well-known systems science. In the past 90 some years, methods and thinking logic of systems science have been widely employed in different disciplines (Klir 2001). Similar to how the Cartesian coordinate system, which is made up of several number lines crossing each other, has been playing its role in the development of the traditional science (Kline, 1972), in systems science the role is played by the systemic yoyo model (Lin, 2007). Figure 1 figuratively shows how the systemic yoyo model of a system looks like in our 3-dimensional (Euclidean) space.

Specifically, the blown-up theory (Wu & Lin, 2002), a theory of general development and evolution, and the discussion on whether or not the world can be seen from the point of view of systems (Lin, 1988; Lin, et al., 1990) all point to such a multi-dimensional model as shown in Figure, where the concepts of inputs, outputs, and converging and diverging spinning (or eddy) motions are joined together in this model for each object and every system imaginable. Speaking differently, each system is a multi-dimensional entity that ‘spins’ about its ‘axis’. If we fathom such a spinning entity in our 3-dimensional space, we have such a structure as artistically shown in Figure 1(a). The input side pulls in things, such as materials, information, investment, profit, etc. After funneling through the ‘neck’, things are spit out as outputs. Some of the outputs never return to the input side and some will (Figure 1(b)). Due to its general shape, such a model or structure is referred to as a (systemic) yoyo.

What this intuitive model of general systems says is that each physical or intellectual entity in the universe, be it a tangible or intangible thing, a living being, an organization, a market, an economy, etc., can all be seen as a kind of realization of a certain multi-dimensional spinning yoyo with an eddy and meridian field around. It stays in a spinning motion as depicted in Figure 1(a). If it does stop its spinning, it will no longer be identifiable as a system. What Figure 1(c) shows is that due to the interaction between the eddy field, which spins perpendicularly to the axis of spin, of the model, and the meridian field, which rotates parallel to axis of spin, all the materials that are either new to the yoyo body or returning to the input side travel along a spiral trajectory. As a matter of fact, such multiple
inputs and multiple outputs structure of systems has been explicitly recognized by scholars. For example, Swift (2013, p. 114) describes the consequence of human endeavor as follows: “The successful outcome of entrepreneurship or of any human endeavor is a complex activity with multiple inputs potentially relevant to the outcomes.”

**FUNDAMENTAL PROPERTIES OF RESOURCES**

A resource stands for an asset, be it tangible or not (Harmanciolgu, et al., 2009), which the firm that has control of it can utilize to introduce and implement strategies so that the firm would gain competitive advantages over other competing firms (Barney & Arikan, 2001). That is, a resource represents such a thing, be it physical, financial, intellectual, or organizational, the firm that has possess of it can mobilize it to accomplish the firm’s business goals. Then, firms, resources, and the ownerships of resources satisfy those basic relationships as summarized in the following three assumptions.

**Assumption of Resource Heterogeneity**: Each firm possesses a unique system of resources, no matter which industry the firm belongs to.

Speaking differently, this assumption means that even for firms that operate within the same industry, they still have their individually different systems of resources. This assumption is quite systemically intuitive. In fact, each firm is naturally a system, which is also non-trivial (Lin, 1999) and a yoyo spin field (Lin, 2009). The hard component parts of the system consist of such elements as people, equipment, capital assets, etc. They are organized together into an organic, operational whole in a particular way. Because of the organizational relationships between the hard component parts, the firm comes into being. That is why any two firms can be easily identified by their different systems of resources, for example, different sets of employees or different sets of missions. Because the firms are different, some aspects of their underlying organizational and resource systems are different.

The assumption of resource heterogeneity, formulated based on (Peteraf & Barney 2003), implies that the totality of resources a firm controls is a system, because in real life only when the resources work jointly they produce positive and/or negative outcomes for the firm. In particular, the systems of available resources of two firms can defer in two ways: either what resources are available are different or how the available resources actually work jointly together are different. Therefore, this assumption naturally means that some firms are more capable of accomplishing certain activities than others due to their unique systemic setups of available resources, where other than sets of resources could be different what really makes a big difference is how particularly the available resources are combined to accomplish business goals. In other words, different firms have their individually different strengths and weaknesses.

**Assumption of Resource Immobility**: The differences in the firms’ systems of available resources persist over time due to practical difficulties of trading resources and their associations across the firms.
Intuitively, if we continue the systemic logic of thinking of the previous assumption, then we see that as long as firms stay different from each other, their organizational composites, which of course include available resources, will stay different.

The assumption of resource immobility, furthered developed on the basis of (Barney & Hesterly, 2012), explains why differences between firms generally persist over time. It is because individual firms tend to possess persistently different systems of resources, be the difference in the particular sets of available resources or in how the available resources can work jointly together for their corresponding firms.

**Assumption of Different Levels of Efficiency:** Firms’ performance differs from each other because of the differences in available resources, associations of the resources, and because of the intrinsically different levels of efficiency of utilizing the available resources.

Intuitively, the truthfulness of this assumption is quite straightforward, because the characteristics of the spin motion, as models of the performance of firms of concern, such as spinning direction, strength, density, etc., of the yoyo fields of the firms are naturally different from each other. That explains why the resources available to firms have intrinsically different levels of efficiency.

The assumption of different levels of efficiency, formulated on the basis of (Peteraf & Barney, 2003), reflects the fact in real life that firms strategically deploy their available resources in different ways. The differences in the strategies applied naturally lead to different levels of efficiency.

A firm has a competitive advantage, provided that the firm has a particular strategy or way of operation, production, and/or management with which the firm generates more economic value than other firms (Peteraf & Barney, 2003). In such a case, the firm generally has invented a special way to mobilize its resources. If, additionally, other firms in the same industry are unable to duplicate the benefits of this strategy, then the competitive advantage is known as sustained (Barney & Clark 2007); if the advantageous situation of the strategy continues into the future, then the advantage is referred to as sustainable (McGrath, 2013). Then, based on the previous assumptions, the following two propositions naturally follow.

**Proposition 1:** If a firm possesses such a system of available resources that few other firms have due to various reasons, such as history, relational networks, cost, intellectual and/or physical difficulty to replicate, etc., then the firm will have a great opportunity to develop a sustainable competitive advantage.

Barney and Hesterly (2012) initially formulated a slightly different version of this proposition, while the proposition’s truthfulness is quite systemically straightforward. To this end, let us model the firm as a spinning yoyo. Then the assumption of the proposition implies that for some reason the underlying force that has the potential of making the yoyo field of the firm spin strongly is not shared by the yoyo fields of most other competing firms. Therefore, the yoyo field of this specific firm has a chance to spin strongly or differently from the ways of how the yoyo fields of other firms spin. However, the eventual appearance of a sustainable competitive advantage depends on internally how the system of the firm is composed of – or whether or not the firm is able to discipline itself to make use its special underlying force.

The assumed scarcity of resources means directly that if the firm could make use of its scarce resources, few other firms could potentially compete with it successfully on the ground of the particular set of resources. The potential development of sustainable
competitive advantages, which take advantage of the scarce resources, of course, depends on whether or not the firm could find an innovative way to mobilize its resources. For example, in their rivalry, the Eastman Kodak surely had very specific resources available to itself when compared to Fuji Films. Nonetheless, the organizational culture of Kodak prohibited itself from developing a sustainable competitive advantage through innovatively mobilizing its available resources against Fuji Films (McGrath, 2013).

A resource (or a set of resources) is valuable to the firm, provided that the resource enables the firm to strategically increase its profit by lowering costs and/or increasing revenue beyond what would have been the case without the resource. That is, a resource is valuable if the resource empowers the firm to take advantages of an external opportunity and/or to neutralize an external threat. A resource is rare, provided that a small number of competing firms possess it. A resource is exploitable by the firm that have control of the resource, provided that the firm has an appropriate organizational culture, processes, policies, and procedures to exploit the potential benefits of the resource.

**Proposition 2:** If a resource (or a set of resources) a firm controls is simultaneously valuable, rare, and exploitable by the firm, then the firm will be able to design and implement a sustainable competitive advantage out of the resource.

A slightly different version of this result was initially formulated by Barney and Hesterly (2012); and the current version is really a corollary of Proposition 1. And its truthfulness is quite systemically clear. In fact, by continuing the systemic modelling given in the analysis of Proposition 1, the assumption of this current proposition that the firm is able to exploit the resource means that the systemic composition of the firm allows it to take advantage of the resource.

On the other hand, notice that being valuable alone is not sufficient for a resource to generate a competitive advantage for the firm. It is because other firms can very possibly have the resource too or while the firm recognizes the value of the resource, it is just neither culturally nor organizationally suitable to make use of the resource. For example, in 1979 Tom Whiteley, the head of Emulsion Research Division of the Eastman Kodak, attended personally slide presentations with the slides produced out of Xerox Alto, an early version of a personal computer. But, with his mindset and the then-culture of Kodak he did not see the need and urgency to take advantage of the new technology and the available human talents. In other words, the systemic structure of the Eastman Kodak was not fit at the time to monetize the just-gained new knowledge and relevant technician of the firm by introducing and mobilizing a time-changing resource. Instead, the company continued to exploit and strengthen its long-standing advantages in film. That led to the company’s defeat in competing with Fuji Photo that moved into a bright future without film (McGrath, 2013).

If a resource is not rare, then exploiting such a resource, when the value is recognized, generally leads to intensified competition in the product market, because other firms will mostly likely have the capability to exploit the resource, too. To illustrate this, a good example is how market competition has driven the price of personal computers all the way down to the level that nearly no profit can be made. If a resource is valuable, then its rarity means that the resource is also imperfectly imitable, meaning that it is impossible for competing firms to duplicate or substitute the resource due to various constraints, such as history, prohibitive cost, intellectual limitations, physical inabilities, organizational complexity, etc. On the other hand, if a valuable resource is perfectly imitable, then it will no longer be rare, because the recognized value definitely encourages other firms to duplicate or to substitute the resource, making the earlier rarity disappear quickly.
Lastly, for a firm to generate a sustainable or any competitive advantage out of a resource, the firm has to be able to exploit the resource, because only an organizational culture with appropriate philosophical and value system could lead to profitable exploitation of any particular resource. In other words, only when the firm is under the influence of two key organizational factors – the systemic structure and orientation of the organization, the firm is able to first recognize the potential value of a resource, second introduce a unique way to take advantage of the resource by considering the opportunities afforded by the market, and then enable the realization of the benefits embodied in the resource (Barney & Clark, 2007; McGrath, 2013).

**Proposition 3:** If a resource or a set of resources of a firm is simultaneously valuable and rare, and if the managers’ interests are aligned with those of shareholders, then the resource will result in a sustainable competitive advantage for the firm.

In fact, the assumption that the managers’ interests are aligned with those of shareholders implies that the particular resource or the particular set of resources is effectively exploitable by the firm. Hence, Proposition 2 indicates that a sustainable competitive advantage will be resulted in.

Because of their relevance to the rest of this paper, let us quote the following two results (Forrest, et al., 2017) here with proofs in order to make this presentation self-contained.

**Theorem 1.** In the coordinately monopolized market of $m$ incumbent firms that is described below, a sufficient and necessary condition for at least one new enterprise to enter the market profitably, as a competitor of the existing firms, is that the consumer surplus $\beta = 1 - m \alpha \geq \alpha$.

**Theorem 2.** If the consumer surplus $\beta = 1 - m \alpha$ is at least $\alpha$, then there is a threshold value $\alpha^* \in (0, 1/(m + 1))$ such that when $\alpha \geq \alpha^*$, the expected price of the incumbent firms is higher than that of the new entering firm and the expected profits of any incumbent firm are lower than those of the new entering firm.

All the details of these two theorems are given here: The oligopoly market is occupied by $m$ incumbent firms, $m = 1, 2, 3, \ldots$ Each of the firms has developed its respective share $\alpha$ of loyal consumers who purchase the products from their respective firms only as long as the price is not more than their reservation price, which is set to be 1, assuming, without loss of generality, that all the firms have a same percentage market share $\alpha$ of loyal consumers. And there is a market segment $\beta$ (in percentage) of consumers who switch from the product of one firm to another depending on whose price is more competitive. The incumbent firms compete over the switchers with adjustable prices charged to their consumers. The managements of these $m$ firms are well aware of the pricing strategies of the other firms and have established their best responses by playing the Nash equilibrium through pure self-analyses.

The result of Theorem 1 explains why the $m$ incumbent firms compete over the market switchers instead of just hold on to their respective bases of loyal consumers by charging them the reservation price. Specially, although the $m$ incumbent firms in theory could be risk neutral and continuously reap in their respective profits from their established turfs, they still have to fight over the switchers in the market in order to reduce the size of the switcher segment. It is because, as implied by Theorem 2, when the size of the segment of switchers grows greater than the size of the loyal consumers’ base of any of the incumbent firms, new competition will surely enter into the market. Not only so, the entering firm can also potentially make as much profit as any of the incumbent firms.
EXPLOITATION AND EXPLORATION OF COMPETENCE

Such variables as marketing capabilities, technology and R&D capabilities, innovation ambidexterity, and competencies related to sensing and responding to changes in the market environment, be they about customers or competitors or both, are considered market-based resources (Lee & Grewal, 2004; Li & Calantone, 1998; Moorman & Slotegraaf, 1999).

The well-known capability-rigidity paradox describes the following tough managerial challenge, resolution of which will help a firm sustain its competitive advantage: Many firms are adept at exploiting existing capabilities, but faltering in simultaneously exploring and developing new capabilities (Dougherty 1992; O’Reilly & Tushman, 2004; Leonard-Barton, 1992).

**Proposition 4**: Market orientation of a firm and its capability to act accordingly enable the firm to resolve the capability-rigidity paradox, and consequently helps the firm to sustain its competitive advantage that in turn means superb performance.

From how the paradox is formulated, it follows that the key to the resolution of this paradox is the appearance of one or several organizational factors that can ensure the firm to place simultaneous emphasis on both the exploitation of existing innovation capabilities and the exploration of new ones. The exploitation keeps the firm afloat financially for the present and the near term while the exploration, although it can be riskier and represents a more active process of discovery of new resources and technologies (Noble, et al., 2002), helps the firm to pay sufficient attention to the future. Such an equal split of attention between how the business is doing now and how it will be doing in the future surely requires the firm to have sufficient knowledge resource of the current and future customers and competitors. That is, market orientation of the firm will help resolve or lessen the severity of the capability-rigidity paradox (Day 1994; Hurley & Hult, 1998; Atuahene-Gima, 2005).

If the firm is seen as a spinning yoyo field fighting against all other spinning pools in the ocean of many competing yoyo fields of the marketplace, it is quite clear that in order for the firm to succeed in its struggle, it has to be able to foretell how everyone spins currently and expectedly in the future. With such knowledge in place, if the firm can also adjust itself accordingly with insightful strategic actions, then of course it will be able to either resolve completely or lessen the severity of the capability-rigidity paradox and sustain its competitive advantage, which consequently leads to superb performance.

As for why firms with analogous customer and competitor knowledge exhibit different capacities for competence exploitation and exploration, it is really rooted in differences in the interpretations of the knowledge and how the knowledge is coordinated and integrated among functional units beyond knowledge itself (Grant, 1996). That explains why the firm’s capability to act accordingly enables the firm to resolve or lessen the severity of the capability-rigidity paradox in different ways, where different interpretations of the knowledge and the corresponding actions lead to different levels of business success and failures.

**Proposition 5**: What is most important that underlies good firm performance is the interaction of marketing, R&D and operational capabilities.

Marketing capability of the firm bridges the firm about what it is and what it can do and the product market regarding what the current and expected focus of firms’ competition is and what the consumers want (Kotler & Keller, 2016; Jaworski & Kohli, 1993). So, marketing capability both influences the innovative output of the firm and presents the firm to the market. Now, the R&D capability of the firm converts the acquired market information
into conceptual products to meet consumers’ evolving demand while making it extremely difficult for competitors to imitate (Irwin & Klenow, 1994). If the firm’s R&D capability has a strong track record of consistent innovations that always produce externality benefits associated with its conceptualized products, then such capability will enhance the firm’s image and consumers’ favorable expectations. Practically, if an appropriate operational capability, the complexity of which makes it imperfectly mobile and imperfectly imitable, practically implements the knowledge gained from the marketing capability and materializes ideas and designs of newer and better products of the R&D capability into sellable goods, then good firm performance will follow (McGrath, 2013; Hayes, et al., 1988). Therefore, according to Proposition 2, the interaction of marketing, R&D, and operational capabilities represents the most important determinant underlying the good performance of the firm.

**FIRM’S TECHNOLOGICAL OPPORTUNISM, INNOVATIVENESS AND PERFORMANCE**

By definition, a firm’s capability represents a process that enables the firm to deploy its resources (inputs) to materialize its business goals (outputs). So, each firm’s capability is an input-output mechanism (Dutta, et al., 1999). Jointly the totality of all the firm’s capabilities can be very well modelled as a systemic yoyo, where the higher the functional capability – the interaction of the marketing, R&D, and operational capabilities – the firm possesses the more efficiently it is able to deploy its productive inputs to achieve its functional objectives. In other words, the better the yoyo field of the firm is able to predict how other competing fields will behave, to design proactively appropriate ways of reaction, and to implement what is imagined necessary, the stronger (or the better performance) the yoyo field of the firm will spin (or achieve).

**Proposition 6**: Market knowledge competence increases new product advantage, which in turn increases the firm’s performance in the product market.

This result is a corollary of Proposition 5, because market knowledge competence means such processes that generate and integrate market information and knowledge (Li & Calantone, 1998).

**Proposition 7**: The technological opportunism of a firm impacts the magnitude of radical technology adoption, while future focus and top management’s advocacy of new technologies increase technological opportunism of the firm.

From the definition of technological opportunism, which is defined as the sense-and-response capability of a firm in its adoption of radical technologies (Srinivasan, et al., 2002), it follows readily that the more technological opportunistic the firm is, the greater magnitude it is for the firm to adopt radical technologies. Because the top management represents the center of the organizational system of the firm, where a slight vibration of the center sends large waves of changes across the entire system (Lin, 1999; Hall & Fagen, 1956), it follows that future focus and top management’s advocacy of new technologies increase technological opportunism of the firm.

Since the market invites competition and stimulates innovation (Theorems 1 and 2), networking relationships with various actors of the firm’s environment are critical for information gathering, testing, and the adoption of innovations (Arnold, et al., 2011; Romijn & Albaladejo, 2002), the following result reveals the influence of relational resources on innovation.
Proposition 8: If a firm is established for the purpose of satisfying a particular market niche through generating a positive cash flow, which can be the consequence of profits made from the marketplace, or investments from investors, or a combination of both, then the relational resource of the firm bears extremely important impact on the innovativeness of the firm.

In fact, the assumption about why the firm exists implies that the firm’s yoyo field attracts through various interactions with the outside world whatever inputs necessary for the firm to make adjustments and to reposition itself in the marketplace in order to survive. These interactions help provide the firm with new and crucial information, knowledge and additional resources, all of which strengthen the competitiveness and innovativeness of the firm or the intensity of spin of the yoyo structure of the firm. To such theoretical height does this systemic conclusion carry the relevant empirical discoveries (Freel, 2003; Ritter & Gemunden, 2003; Beugelsdijk & Cornet, 2002; Landry, et al., 2002; Romijn & Albaladejo, 2002; Souitaris, 2002; Kaufmann & Todtling, 2001), which are either positive or non-significant on how relational resource and innovation are correlated. And in this context, the pattern of movement in Figure 1(c) indicates that in general the innovation process represents a nonlinear evolution of ideas and related processes on how to implement the ideas into marketable products, as empirically confirmed by various authors such as Dosi et al (1988), Kaufmann and Todtling (2001), Kline and Rosenberg (1986), and Malecki (1997).

INTERACTIONS OF RESOURCES

Many resources studied in management and marketing research, such as brand, relational assets, knowledge generating capabilities, are intangible. Because intangible resources, such as these resources and similar ones, are valuable, rare, and imperfectly imitable, Proposition 1 implies that the firm that possesses intangible resources is likely to develop sustainable competitive advantages.

Due to systemic effects, such as the whole is greater than the sum of parts (Lin, 1999), it is reasonable and logical to imagine that when different resources are placed in service jointly, the outcome is expected to be better than that produced by only employing one of the resources (Kozlenkova, et al., 2014). However, when some particular resources interact with each other, undesirable effects can appear. For example, the study of interacting capabilities related to new product development, customer management, and supply chain management suggests that trade-offs may be involved among different resources (Ramaswami et al. 2009). In particular, capabilities of customer management interact positively with capabilities of new product development but negatively with those of supply chain management. To this end, we have the following general result:

Proposition 9: For two opposing business goals A and B, any interaction between the mutually exclusive sets X and Y of resources, where resources in X lead to the realization of goal A and those in Y help actualize goal B, tends to produce undesirable effects.

For example, capabilities developed only purposefully for the goal of implementing the strategy of exploiting the proven successful competitive advantages generally do not work right with those capabilities introduced only for the purpose of implementing the strategy of constantly discovering new competitive advantages (McGrath, 2013). On the other hand, there are capabilities, such as strong relationships that lead to information sharing, risk taking, and adoption of innovations (Dutta, et al., 1999), which can be deployed easily in multiple directions. That is, interaction of the special resources acquired only for materializing either goal A or goal B but not both generally leads to undesirable effects. Figuratively, Proposition
9 is depicted in Figure 2, where the sets of resources developed for goal A and for goal B respectively do not overlap, while the general purpose resources can be redeployed easily to serve different, even opposing goals.

**Proposition 10**: Market-based resources most likely exhibit stronger effects on firm’s performance than non–market-based resources do.

By definition, market-based resources represent such assets of the firm that can be used to design and implement strategies (Harmancioglu et al. 2009) and that are closely related to the current conditions and expected trends of the market (Lee & Grewal, 2004; Li & Calantone, 1998; Moorman & Sloteagraaf, 1999). For example, marketing capabilities, technology and R&D capabilities, innovation ambidexterity, and competencies related to sensing and responding to changes in the market environment, be they about customers or competitors or both, are all market-based resources. Hence, market-based resources most likely exhibit stronger effects on the firm’s performance than non-market-based resources do, because the former help bring the firm’s products and services to where the market demand is, while the latter tend to play a supporting role by complementing the former. Empirically, Hooley et al (2005) demonstrate the truthfulness of a slightly weaker version of Proposition 10.

**DEVELOPMENT AND DECAY OF RESOURCES**

The anecdotes that after Walt Disney died, Disney’s brand equity persevered through two decades of neglect, and that Xerox lost its innovative capability regarding photocopiers in only a few years (Collis & Montgomery, 2008) suggest that different types of resources and capabilities develop and decay at different rates. The concept of capability life-cycle (Helfat & Peteraf, 2003) articulates how organizational capabilities evolve over time through stages and how heterogeneity in these capabilities appears. By organizational capability, it means the ability for an organization to perform a coordinated set of tasks, utilizing resources, for the purpose of achieving a particular end result, referred to as objective. The following result sheds light on what factors would help to lengthen or shorten an organizational capability’s effective life.

**Proposition 11**: If an organizational capability A is developed by a leadership capable of coordinating joint actions to achieve a particular objective B, then capability A will evolve from the stage of founding through that of development to that of maturity until when objective B ceases to exist because it has been accomplished or is altered within the changing market environment. If objective B ceases to exist, then capability A will retire; if objective B is altered, then capability A will evolve into one of the following six branches: retirement (death), retrenchment, renovation, replication, redeployment, and recombination (with pooled together with other capabilities).

In fact, when a capable person (or a team of people) identifies a market opportunity, which generally is a market’s call and invitation, as shown by Theorems 1 and 2, which requires people with special talent to identify, a group of individuals endowed with human capital, social capital, and cognition, is organized to achieve a central objective by a leadership capable of coordinating joint actions (Helfat & Lieberman, 2002; Levinthal & Myatt, 1994). In real life, such group of individuals might very well consist of total strangers. In fact, no matter whether it consists of strangers or not, the natural appearance of the leadership within the newly formed group of talents is guaranteed by the following theorem of systems science:
Theorem 3: Assume that:
k is an infinite cardinality and \( \theta > k \) a regular cardinality satisfying that, for any \( \alpha < \theta \), 
\(|\alpha|^k < \theta\); 
\( S = (M, R) \) is a system satisfying \(|M| \geq \theta\); and 
Each object \( m \in M \) is a system with \( m = (M_m, R_m) \) and \(|M_m| < k\).

If there exists an object that is contained in at least \( \theta \) objects in \( M \), then there exists a partial system \( S' = (M', R') \) of \( S \) such that \( S' \) forms a centralized system and \(|M'| \geq \theta\).

Because the proof of this result is very technical, it is left in the appendix.

In non-symbolic terms, what Theorem 3 says is that if a group of people work together to accomplish a complicated task, where each individual in the group has only a limited role to play, then a leader or a leadership of several individuals will emerge, even though the people might not know each other initially. For details on how such an interpretation of a result similar to Theorem 3 is established, see (Lin, 1988).

Around the identified central objective, a particular organizational capability is formulated or founded by holistically employing the individually endowed talents of the group (or team). When the team searches for viable ways to accomplish the end result of the central objective, an appropriately working capability appears (Winter, 2000). The choice of which viable way to pursue depends on the boundary conditions at the founding stage through learning-by-doing both individually and collectively as a team (Helfat & Peteraf, 2003). This stage of development ends when the team perceives the capability as good enough (Winter, 2000). That is when the capability enters into its maturity stage, where it is maintained and repeatedly exercised.

If at this moment of evolution the central objective is no longer there or has been achieved successfully, then the organization, established on top of the initial group of individuals, will dissolve or will aim at a different objective. In the former case, the established organizational capability will cease to exist, since it is no longer needed; while in the latter case, the capability will branch out in several directions, Figure 3, when factors external to the capability exert a strong enough impact to alter the current development trajectory of the capability.

These factors could be either internal or external to the organization within which the capability resides. Figure 3 depicts the general evolution of a capability starting from the initial founding to the eventual branching. Although two particular moments are clearly labelled, one for the start of maturity and the other for that of branching, in real life, not all capabilities have clearly marked moments of separation between stages of development. As a matter of fact, branching can occur at any stage from that of development onward, depending on the initial endowments available at the founding stage and the central objective the organization aims at achieving. Additionally, the choice of which branch the capability will take on depends on the particular capability and selection effects, external to the capability, and what internal reactions the firm is taking (Helfat & Peteraf, 2003). All the selection effects are rooted in the changing nature of the central objective the capability was initially founded to address. When the central objective evolves with the changing market condition, some selection effects can appear as threats that will make the capability obsolete, while other section effects provide opportunities for the capability to grow and to change.

Proposition 12: Only if a firm is capable of using relevant information of the market, the firm's resources are able to increase the firm's performance.

In fact, the assumed increasing performance of the firm, as caused by the firm's resources, has to be a consequence of the fact that the firm's products and/or services are
better meeting the demand of the market than those of other competing firms. To better satisfy the demand of the market, the firm’s product development must have achieved better outcomes in the market competition than other firms do. That, of course, implies that the firm is able to use, either consciously or unconsciously, relevant information of the market, such as what the market is calling for (Theorems 1 and 2), how competitors are positioned in the marketplace, what the features of the competing products and services are, what the competitors’ pricing strategies are, etc., on its product development, as confirmed by the economics of information (Stigler, 1961), a conclusion of which is that information can facilitate consumer search and increase competitive activities. Empirically, a special case of Proposition 12, concerning only technology and marketing resources, was shown by Moorman and Slotegraaf (1999).

Systemically speaking, the firm’s increasing performance implies that the yoyo field of the firm moves in advantageous ways when compared to the movement patterns of the yoyo fields of other competing firms (Figure 4).

WHEN A FIRM FAILS TO CONSISTENTLY EXPLOIT ITS RESOURCES

As for the problem of when a firm could potentially fail its exploitation of available resources, we have

**Proposition 13**: A firm fails to consistently exploit its available resources to achieve superior performance, if one or more of the following conditions hold true:

1. The firm does not have any constantly reinforced policy or procedure in place to exploit its available resources;
2. The firm is not market oriented and/or is unable to react to market invitations;
3. The firm cannot organically (or distinctively) combine marketing and R&D capabilities, supported accordingly by appropriate operations; and
4. The firm cannot sense in a timely fashion what the market is signaling when compared to competing firms.

In fact, for the firm to *consistently* exploit its available resources to achieve superior performance, the firm has to have a mechanism in place that relentlessly pushes the organization towards superb performance. Hence, Proposition 1 implies that the firm needs to have policies and procedures, which are constantly in effort, which support the exploitation of its resources. That is, condition 1 holds true.

When the firm is not market oriented and is unable to react to market invitations (Theorems 1 and 2) accordingly, it means that the firm cannot consistently adjust its strategies to stay in sync with the market development (McGrath, 2013). When that is the case, the firm will not be able to consistently exploit its available resources to achieve superior performance (Proposition 4), even though once in a while the firm’s performance could be superb by chance. That is like the situation of a broken clock that can still be correct twice a day by chance. That is, condition 2 holds true.

The reasoning for condition 3 is similar to that of condition 2 above and follows from Proposition 5. Condition 4 implies that the firm is mostly behind its competitors in terms of receiving and comprehending market cues; so Proposition 6 implies that the firm will not be able to consistently exploit its available resources to achieve superior performance when compared to its competitors.

In terms of management, the previous proposition can be rewritten as follows:
Proposition 14: A firm fails to consistently exploit its available resources to achieve competitive advantage, if one or more of the following conditions hold true:

The firm’s leadership lacks capability needed to maximize the potential of the available resources;

The self-interests of the firm’s managers diverge from those of the owners; and

The philosophical and value systems of the managers limit the financial performance of the firm.

In fact, when condition 1 holds true, then various versions of the four conditions in Proposition 12 will become true. So, the conclusion that the firm fails to consistently exploit its available resources to achieve competitive advantage follows.

When either condition 2 or condition 3 is true, conditions 2 and 4 in Proposition 13 will likely become true. So, the conclusion of this proposition follows.

A result similar to Proposition 14 was also established by Hunt (1997) by using resource advantage theory (Hunt & Morgan, 1995).

Proposition 15: If a firm is driven to innovate by its inferior financial performance, then the drive is both endogenous and exogenous to the firm.

In fact, when the firm is driven to innovate due to its inferior financial performance, it means that the firm has employed the feedback mechanism (Lin, 1999), Figure 5, of the market information: it occupies an inferior position in the marketplace relative to other competitors. That generally means that the firm possesses a comparative disadvantage when compared to its competitors. So, the drive for innovation in this case comes from the firm’s internal analysis of its performance. In particular, by introducing desired innovation based on self-analysis of where the firm’s disadvantage is located into the operation of the firm, the earlier inferior performance will improve and be soon replaced by superior performance. Here, the feedback loop represents a way for the firm to become more competitive than before.

On the other hand, if the firm takes in the market cue (Theorems 1 and 2) regarding what is demanded by the consumers, then the consequent innovation taken up by the firm will be seen as exogenous to the firm.

CONCLUSION

This paper uses the thinking logic of systems science in general and the systemic yoyo model in particular to look at various research topics of management and marketing based on the resource-based theory. Because the issues addressed in this paper are about characteristics and operations of organizations, we are able to beautifully employ the methodology of systems science instead of empirical analysis to establish general and practically useful results unique to domains of management and marketing from the angle of resources. In particular, after justifying three basic assumptions, known as resource heterogeneity, resource immobility, and different levels of efficiency, this paper develops the following results:

Conditions under which a firm is likely or certainly to develop sustainable competitive advantages are given;

How the capability-rigidity paradox can be resolved;

What could potentially lead to improved firm performance;

What impacts the magnitude of radical technology adoption;

How relational resource impacts the innovativeness of the firm;
When interactions of resources could lead to undesirable effects;
When a capability would evolve from the stage of founding to maturity and when it
would cease to exist; and
When a firm would fail to consistently exploit its resources.

Other than establishing these general results, which is impossible when only empirical
analysis is employed, another important contribution this work makes to the literature is the
introduction of the thinking logic and methodology of systems science into the study of
management science and marketing. When compared to methods of empirical analysis, the
thinking logic and methodology of systems science avoid all limitations and uncertainties of
data mining. That is the very reason why we are able in this paper to establish general results
that will be practically applicable to produce tangible and reliable outcomes.

In other words, the relevant studies in the literature, be they conceptual or empirical, are
generally affected adversely by the limitations and uncertainties involved in the collection
and analysis of data. So, when business managers have to decide what actions to take in their
daily business operations based on such studies of limited validity, they face a great deal of
uncertainty in terms of what they can expect as the consequence of their chosen actions.
Opposite to the theoretical and practical uncertainties that exist in the literature, this work
uses logical reasoning based on three very straightforward assumptions to establish results
that are generally applicable in real life.

As for the limitation of this work, all conclusions are derived on the definitions of
(respectively, valuable, rare, and exploitable) resource and competitive advantage, where the
buzz words and phrases are asset and that the firm makes “more economic value than other
firms”. That means that this work does not include situations where the firm only wants to
“stay alive” instead of creating more economic value than other firms do. In real life, many
firms actually fall into this category. As for the buzz word asset, if the firm is seen as a
system, then two natural questions arise: Which systemic part(s) or process(s) of the firm
can be treated as assets is not clear, because the assets in one person’s eyes might not amount
to much or anything important at all in another person’s eyes? And among all the identified
assets that have contributed to the success of a particular strategy, which ones have played
more important roles than others? These and other related questions need to be studied in
future works, maybe first empirically and then theoretically.

**APPENDIX: PROOF OF THEOREM 3**

This technical argument is provided here to make this presentation self-contained. For
those readers who are only interested in the role this result plays, skipping this proof will not
interrupt the flow of reading the rest of this presentation.

Without loss of generality, let us assume that $|M| = \theta$ and that there is a common
element in all the object systems in $M$. Then we have the following, where each system is
defined as an ordered pair of sets $x = (M_x, R_x)$ with $M_x$ stands for the collection of all
elements of the system and $R_x$ the set of all relations between the elements (Lin, 1999):

$|\{M_x: x = (M_x, R_x) \in M\}| \leq \theta$.

Because the specific objects in each $M_x$, for each object $x = (M_x, R_x) \in M$, are
irrelevant, we assume that

$\bigcup \{M_x: x = (M_x, R_x) \in M\} \subseteq \theta$.

Then, for each $x = (M_x, R_x) \in M$, the object set $M_x$ has some order type $< \kappa$ as a subset
of $\theta$. Because $\theta$ is regular and $\theta > \kappa$, there exists a $\rho < \kappa$ satisfying that $M_x = \{x \in M: M_x$
has order type $\rho$ has cardinality $\theta$. Let us fix such a $\rho$ and deal only with the partial system $S_1 = (M_1, R_1)$ of $S$, where $R_1$ is the restriction of the relation set $R$ on $M_1$.

For each $\alpha < \theta$, $|\alpha^{<\xi}| < \theta$ implies that less than $\theta$ objects of the partial system $S_1$ have object sets as subsets of $\alpha$. Thus, $\bigcup\{M_x : x = (M_x, R_x) \in M_1\}$ is cofinal in $\theta$. If $x \in M_1$ and $\xi < \rho$, let $M_\xi(\xi)$ be the $\xi$th element of $M_\xi$. Since $\theta$ is regular, there is some $\zeta$ such that $\{M_\xi(\xi) : x \in M_1\}$ is cofinal in $\theta$. Now fix $\xi_0$ to be the least such $\zeta$. Then the condition that there exists a common element in each system in $M_1$ implies that we can guarantee that $\xi_0 > 0$. Let $\alpha_0 = \bigcup\{M_x(\eta) + 1 : x \in M_1 \text{ and } \eta < \xi_0\}$.

Then $\alpha_0 < \theta$ and $M_\xi(\eta) < \alpha_0$ for all $x \in M_1$ and all $\eta < \xi_0$.

By transfinite induction on $\mu < \theta$, pick $x_{\mu} \in M_1$ so that $M_{\alpha_0}(\xi_0) > \alpha_0$ and $M_x(\xi_0)$ is above all elements of earlier $x_{\xi}$, i.e.,

$$M_{\alpha_0}(\xi_0) > \max \{ \alpha_0, \bigcup \{ M_x(\eta) : \eta < \rho \text{ and } \nu < \mu \} \}.$$

Let $M_2 = \{ x_{\mu} : \mu < \theta \}$. Then $|M_2| = \theta$ and $M_x \cap M_y \subseteq \alpha_0$ whenever $x = (M_x, R_x)$ and $y = (M_y, R_y)$ are distinct objects in $M_2$. Since for each $\alpha < \theta$, we have $|\alpha^{<\xi}| < \theta$,

there exists an $r \in \alpha_0$ and a $B \subseteq M_2$ with $|B| = \theta$ and for each $x \in B$, $M_x \cap \alpha_0 = r$, $S_2 = (B, R_B)$ forms a centralized system, where $R_B$ is the restriction of the relation set $R$ on $B$. QED

REFERENCES


Figure 1. (a) Eddy motion model of the general system; (b) The meridian field of the yoyo model; (c) The typical trajectory of how matters return.

Figure 2. How available resources are divided.
Figure 3. How a capability evolves in a stylized fashion

Figure 4. Position its product/service in an advantageous situation

Figure 5. The feedback mechanism
A GENERALIZED VALUE CHAIN FRAMEWORK SIMULTANEOUSLY USEFUL FOR COMPANIES THAT OFFER EITHER PRODUCTS, OR SERVICES, OR INFORMATIONAL GOODS

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ABSTRACT

Because of the rapid development of virtual markets, it has been independently recognized by multiple authors that the value chain framework developed by Porter in 1985 is no longer adequate for decision makers to analyze business firms that do not produce physically tangible products. To meet this theoretically important and practically significant challenge, this paper generalizes Porter’s work so that the result is equally applicable to the analysis of varied kinds of companies, no matter whether they offer products as traditionally known, or services, or informational goods. In doing so, based on logic reasoning and systemic thinking this paper establishes a series of formal propositions by looking at the overall landscape of the fast changing world of business from several different angles: market competition, innovation, resource, inter-organizational network, and direct association of sellers and buyers. At the conclusion this paper provides practically reliable general recommendations for entrepreneurs, managers and retailers, respectively, and points to several unsettled questions for future research.

INTRODUCTION

With the rapid development of virtual markets, promising new avenues of wealth creation have appeared for both established firms and entrepreneurs (Forrester Research Report, 2000). Simultaneously, these virtual markets have been transforming the known rules of competition in unprecedented ways, attracting the attention of scholars in the areas of entrepreneurship and strategic management (Hitt and Ireland, 2000). They have also
accelerated the speed of knowledge development and acquisition and that of sharing of information and know-hows, and stimulated quick turnovers of innovative products, brand new kinds of services and informational goods that never existed before (Amit & Zott, 2001). Although Porter (1985) formulates the earlier version of value chain framework that provides a basis for analyzing production and manufacturing firms, Stabell and Fjeldstad (1998) find that it is not quite applicable for analyzing service firms. Jointly the afore-mentioned phenomena and facts post a serious question for the business decision makers: Within the present world of rapid change how would a generally applicable value chain framework be?

By using logic reasoning and systems thinking (Lin, 2009), the present paper attempts to address this theoretically important and practically significant question from different angles – market competition, innovation, resources, networks, and direct seller-buyer platforms. After establishing a series of 18 theoretical propositions, we are able to generalize Porter’s (1985) earlier value chain framework so that our new framework can be equally applied to analyze firms that either produce physical products, or offer services or provide informational goods. In particular, among other theoretical conclusions, this paper shows the following major results: (1) In markets of free competition, the effectiveness of protective property rights and complementary assets is positively correlated to that of innovations on value creation, while market exchanges help materialize latent values of resources. (2) The speed of creative destruction is a function of the circulation speed of information. (3) Mobility of resources directly leads to the capability of value creation. (4) A state of mutual forbearance implies relatively sustained profitability. (5) A firm’s membership in an inter-organizational network that enjoys an expanding market influence carries a positive effect on the firm’s profitability.

In terms of methodology, both logic reasoning and systems thinking are those that can be universally employed to investigate problems and issues from the entire spectrum of knowledge exploration. And conclusions derived from using these methodologies are not data- and/or anecdote-specific. Therefore, they do not suffer from any of the drawbacks of econometric methods. That is, conclusions established in this paper are more reliable and practically useful than those based on data mining and anecdotal analysis. In other words, other than the contributions mentioned in the previous paragraph, another important contribution this paper makes to the relevant literatures is the introduction of a brand new way of reasoning into the investigations of value creation and value capture.

The rest of the paper is organized as follows. The next section reviews related literature and demonstrates contribution of this work, followed by a section that provides the reader with the necessary basics of systems thinking and methods and introduces the needed terminology for the rest of the paper. The next four sections respectively develop four propositions on how value can be created in a market of free competition through innovation, considers how idiosyncratic systems of resources can lead to value creation, looks at how market forbearance, supply-chain networks and strategic blocks positively affect the profitability of member firms, and investigates how inter-organizational networks and platforms that directly connect sellers and buyers can help firms grow. Based on what are established in all these sections, we generalize Porter’s (1985) value chain framework. This paper is concluded with general recommendations for managers, entrepreneurs and retailers.

LITERATURE REVIEW
There is a huge literature on innovation, started from the time when Adam Smith (1776) states that innovation represents a critical economic activity that fosters wealth. Over the years, scholars have focused on what could potentially make a firm innovative. Along this effort and research direction, nearly sixty different environmental and internal factors that determine the innovativeness of a firm are identified (Becheikh et al. 2006). Different from most of the works in this literature, the contribution the current work makes is to demonstrate the relationship between the effectiveness of protective property rights and complementary assets and the potential innovations have on value creation.

As for the literature of resources, it is Penrose (1959) who first shows why organizational resources are important for the success of firms. And then in the 1980s the well-known resource-based view of the firm starts to take shape (Porter, 1979; Wernerfelt, 1984). A good survey on the importance of the concept of resources and the consequent resource-based theory is given by Kozlenkova et al. (2014). The reason why this concept has successfully caught people’s attention is because resources can be naturally employed to explain various synergistic and differential effects on firms’ performance and the contingencies associated with each effect (Fang et al., 2011). In particular, Dutta et al. (1999) and Moorman and Slotegraaf (1999) suggest that the greatest benefits accrue when externally focused, market-based resources are complemented by internal resources. That is in agreement with Day’s (1994) argument that to exploit outside-in capabilities, there has to be a match with inside-out capabilities. When looking at when sustained competitive advantages can be generated based on available resources, Barney and Hesterly (2012) maintain that some of the resources need to be valuable, rare, imperfectly imitable, and the organization is able to exploit the resources. By extending the resource-advantage theory to an analysis of moderators of the capabilities-performance relationship, Cacciolatti and Lee (2016) are able to explain how different types of marketing capabilities contribute to firm performance. Although resources have a statistically significant influence on non-financial performance of insurance companies, Ombaka et al. (2015) note that the individual influences of resources on various firm performance indicators are mixed. Adding to this quickly expanding literature, this paper shows why a firm’s capabilities are also resources for the firm, how the latent values of resources can be materialized, when resources can lead to value creation, and when resources are inimitable and not readily substitutable.

Instead of competing as atomistic actors, firms are in fact simultaneously embedded in networks (or systems) of various business and exchange relationships with each other (Granovetter, 1985; Gulati, 1998; Galaskiewicz & Zaheer, 1999). That is why the conduct and performance of firms need to be investigated by examining the network of relationships in which they are part of. And specifically formed strategic networks provide their member firms with access to information, resources, markets, and technologies, with advantages of learning and economies of scale and scope. These advantages allow the member firms to achieve their respective strategic objectives (Gulati, et al., 2000). Along this research line of business networks, Harrigan (1985) and Kogut (1988) are among the first who consider the formation of inter-firm partnerships, followed by many others, such as

- Baum and Dutton (1996) – behavior and performance of firms;
- Forsgren (2016) – Uppsala internationalization process mod;
- Gulati (1999) – network resources;
Nohria and Garcia-Pont (1991) – addressing strategic blocks;
Öberg (2018) – innovation;
Zukin and DiMaggio (1990) – structural, cognitive, institutional, and cultural contexts;
Etc.

Going beyond what is known in the literature of business networks, this paper shows why systemic holes within any supply-demand network convene power and stand for profitability for those firms that are fortunate enough to occupy the hole positions; why membership in an inter-organizational network that enjoys an expanding market influence can expect a firm’s profitability to increase; and why offering a convenient platform that directly connect sellers and buyers can be extremely beneficial for the firm that operates the platform, among others.

Additional to the various contributions this paper makes to the relevant literatures, as outlined in the previous paragraphs, perhaps the most important contribution of this work is the introduction of systems thinking into the investigations of value creation and value capture. Because of the universal applicability of this method of reasoning, results established in this paper are not subject to the various limitations of econometric methods and are not data- and/or anecdote-specific. That is why our results can be employed to produce general recommendations for managers, entrepreneurs and retailers.

PREPARATIONS

This section introduces the basic concepts, assumptions and terminologies necessary for the smooth flow of logic reasoning in the rest of the paper.

*Systems – Defined Set-Theoretically*

Because the detailed terminologies of systems thinking employed in this paper do not appear in the literature of relevant studies, this subsection briefly introduces these basics to make this presentation self-contained.

The concept of systems has been used to model the idea of organizations and structures so that parts, seen as isolated in the classical sciences, be they natural or social, are associated into wholes (or systems) by various relations (Lin, 1999). So, systems are everywhere in life, because organizations and structures are the main characteristics of the world. That explains why this concept has appeared in various discussions of business related matters and issues (e.g., Rostow, 1960; Porter, 1985).

Although the concepts of both numbers and systems are abstracted out the same world, they represent two completely opposite aspects of natural existences – the former comes into being when internal structures are ignored, while the latter focuses on internal structures. In other words, numbers and systems are majorly different in two aspects: 1) numbers stands for a small scale local concept, while systems represent a large-scale concept of organizations (Lin, 1999); and 2) numbers appear post existence and after the occurrence of events, while systems surface simultaneously with existences and occurrences (Lin, 2009). That is why systems thinking and methods are more appropriate tools than the classical ones developed on numbers and numerical variables for the investigation of economic entities where internal structures do play any role.
Because of its wide range of applicability, since the time when the concept of systems was initially proposed by von Bertalanffy (1924) in biology, many scholars from across different disciplines have tried with varying degrees of success to define this very concept in different ways by using diverse languages. For our purpose in this paper, a system is defined as an ordered pair $S = (M, R)$ of two sets $M$ and $R$ (Lin, 1999), where $M$ consists of all the isolated objects of the system $S$ and $R$ a set of relations of the objects in $M$. For example, any business firm is composed of a set of employees, properties, equipment, etc., collectively known as objects of the organizational system of the firm, and a set of particular relations that associate the objects into an organizational whole. It is these particular relations that the entity is recognized as a functional system. For the completeness of theory, a discrete system $S = (M, R)$ is such a system that satisfies: $R = \emptyset$ or $R = \{\emptyset\}$ and $M \neq \emptyset$, where $\emptyset$ stands for the empty set. In other words, a system $S$ is discrete, if its objects are not in any way related to each other. Strictly speaking, each so-called discrete system consists of a bunch of isolated and unrelated objects. A system $S = (M, R)$ is called trivial, if $M = \emptyset$. Speaking differently, the concept of trivial system is equivalent to that of zero in the real number line.

For a given system $S = (M, R)$, if $N$ is a subset of $M$, then $S|N = (N, R|N)$ stands for the subsystem of $S$ that its set of objects is $N$, and its relations are those in $R$ restricted on $N$. In other words, for each relation $r$ in the subsystem $S|N$, there is a relation $s$ in $R$ of the original system $S$ such that $r$ consists of all relationship descriptions in $s$ of objects except those descriptions involving objects outside the subset $N$.

For a set of systems $S_i = (M_i, R_i), i \in I$, where $I$ is an index set, if any two of the systems have disjoint object sets, then the free sum of these systems, denoted $\bigoplus \{S_i: i \in I\}$ or $S_1 \bigoplus S_2 \bigoplus \ldots \bigoplus S_n$, if $I = \{1, 2, \ldots, n\}$ is finite, is simply defined as the system whose object set is equal to the totality of the objects in the given systems, and whose relation set that of all the relations in the individual systems. It can be shown mathematically that for any set of systems, its free sum exists uniquely up to a similarity.

A system $S = (M, R)$ is said to be connected, if for any two objects $m_1$ and $m_2$ in $M$, there are a sequence of objects, $n_1, n_2, \ldots, n_k$, in $M$, and a sequence of relations, $r_1, r_2, \ldots, r_{k+1}$, in $R$, for some natural number $k$, satisfying that $r_1$ relates $m_1$ and $n_1$, $r_2$ relates $n_1$ and $n_2$, $r_k$ relates $n_k$ and $n_k$, and $r_{k+1}$ relates $n_k$ and $m_k$. In other words, when a system is connected, provided that any two objects in the systems can be related to each other through a finite number of relations of the system. Otherwise, the system $S$ is known as a disconnected system, meaning that the system is really equal to the free sum of two or more subsystems.

For all the related technical details, see Appendix.

Before we move forward in our presentation, let us emphasize that employing systems thinking and methods to study value creation/capture and generalized value chain framework does more than merely add additional explanatory power to the existing knowledge. Indeed, beyond this newly gained power, the new tools enable us to discover new conclusions and provide generally applicable recommendations that produce reliable real-life benefits. Evidently, such outcomes in and of themselves represent an ultimately worthy academic endeavor – and therein lies the true power of systems science.

Definitions and Basic Terms
To make the logic reasoning in the rest of this paper correct, assume that each and every firm in the business world is established for the purpose of satisfying a specific market demand while its sustainability is maintained by a positive cash flow generated through the business operation. Traditionally, the positive cash flow has to be backed by performance in and profits from the product market (Sobel, 1999). However, in recent times, that is no longer the case, where positive cash flows can be a result of investment inflows based on promise or potential (Li & Ma, 2015). For example, within the global phenomenon of e-commerce there appear online retailers who emphasize more on increasing their market shares than making profits. Although these retailers are losing money one year after another, their focuses are to pump up the future promises and potentials so that they can successfully attract sufficient amounts of venture capitals continuously.

Value is a concept widely studied in various areas of knowledge, such as computer science, economics, investment, marketing, mathematics, music, philosophy, semiotics, etc. In this paper, by value it means a measure of the benefit offered by a product, service or good to an economic agent although the concept is defined differently by the competing schools of economics. Since the relevant literature is very intensive, we omit all of them here.

By value creation, it means that the process a firm goes through in its effort to design and produce outputs that are more valuable than the sum of its inputs. Value creation is made up of two components: creating value for (i) consumers and (ii) shareholders. When consumers are the focus, the attempted value creation helps meet the market demand; and in terms of shareholders, value creation helps attract the future investment capital. By value capture, it means the value the firm whose efforts led to the added value actually captures from meeting the market demand.

By consumers, it means the end users of products, services and/or goods. And, by customers it means those firms that employ the inputs to produce their outputs.

By resource, it represents such an asset of a firm – either tangible or not (Harmancioglu et al., 2009) – that the firm can mobilize to introduce and carry out its strategies (Barney & Arikan, 2001). Speaking differently, a resource represents something physical, financial, intellectual, or organizational, that the firm can utilize to realize its business objectives. And, resources and innovative combinations of resources can practically deliver alternative facilities that differentially improve the firm’s internal efficiency or create value externally for consumers.

By an advantage (or competitive advantage) of a firm, it stands for a strategy or particular way of operation, or production, or management – a special way to mobilize resources –which the firm is able to employ to generate more value than other firms that are considered marginal or just break even in its product market (Peteraf & Barney, 2003).

By virtual markets, it means settings through which business transactions are conducted and business deals are made by employing the internet infrastructure. The main characteristics of virtual markets include convenient connectivity (Dutta & Segev, 1999), easy completion of transactions (Balakrishnan, et al., 1999), self-serving platform for cross-regional and inter-organizational networks to form (Shapiro & Varian, 1999), a provider of free or low-priced information (Evans & Wurster, 1999). The quick emergence of virtual markets has offered participating firms with tremendous amount of new wealth, most of which are generated through entrepreneurial startups and corporate ventures (Amit & Zott, 2001). At the same time, the internet infrastructure represents a world-wide electronic network, through which virtual communities and unconventional commercial arrangements emerge (Hagel & Armstrong, 1997), making knowledge and know-hows widely shared
among firms from different industries and information about products and services instantly available to consumers.

INNOVATION-BASED VALUE CREATION

Corresponding to the emergence of virtual markets, let us define the concept of products in a general fashion as follows: By product it means anything produced by a business entity, be it tangible or intangible, which is demanded by consumer(s). For example, a piece of furniture is a (physical) product that can be used by consumers in their daily livings. An insurance policy is an (intangible) product that consists of promises that consumers can utilize when specified conditions are met. Each of the services provided by a firm, such as a coin-operated laundry service, indoor tanning, etc., is a product, which is also intangible, that is designed and provided by the firm to the public and consumers can ‘receive’ it through enjoying the service. Recommendations of various investment opportunities provided by a financial firm are products, which are informational, produced by the firm through gathering, organizing, and analyzing data.

Next, let us define the concept of innovation as follows based on that of innovation in the manufacturing sector (Forrest et al., 2018): By innovation it stands for such a set of activities – which could be either just one particular activity or several – that is related to the offering of a particular product or a specific bundle of products, leading to exceptionally added value for a company when compared to other activities that take place in the same economic sector.

The phrase ‘the offering of a particular product’ in this definition means implicitly the design and production of an original product that creates exceptionally added value for the company. In the contrary, innovation means all relevant activities that lead to the introduction of the product. In the contrary, the phrase ‘the offering of a specific bundle of products’ is fundamentally different. It indirectly stands for packaging or bundling several products, each of which may not be special or original, together in one delivery the company offers to consumers. The innovativeness behind such bundles of mundane products lies in the potential creation of simultaneous consumer utilities and multi-sided markets. For example, Ye et al. (2012) illustrate how the bundling of self-service, coin-operated laundromats and indoor tanning service creates tremendous amount of demand-side synergies for a university town located in northern USA with long and cold winters. In particular, simultaneous consumer utilities are created when students, living on tight budget, wash their clothes and tan their skin concurrently, saving the otherwise unproductive and costly waiting time; and a two-sided market is formed when the facility provides a place for students to potentially establish relationships because the combined services provides a location and opportunities for both males and females to meet, where women’s greater participation in the tanning service attracts a larger number of men to the laundry service.

Additionally, because of the abstraction of our definition and its emphasis on the comparatively added value, this concept of innovation includes indirectly many practical facets. For example, the emphasis on exceptionally added value implies that an extraordinary degree and excellence of creativity has to be involved over time;

The creativity has to be both internally conceived, motivated by either the current or forecasted future demands, and externally embraced, such as market acceptance;
Relevant new processes are established in terms of how to develop and push products onto the market to create and capture the said value; intended benefits are materialized; other than relevant inventions this concept also emphasizes on the translation of these inventions into new or improved products or processes that help meet the market demand; the definition leaves open the possibility of relative newness in product development; and although not specifically mentioned, this concept includes potential roles of relevant processes and outcomes in general and technological changes in particular.

From this concept, we can see that new and exceptional value is created through innovation, as recognized by Schumpeter (1934), while innovation emerges from different circumstances and in diverse ways, such as introduction of new products or new production methods or procedures, development and construction of new markets, discovery of new supply sources, and reorganization of industries (Schumpeter, 1934). All the newness and the related rarity in different facets associated with innovation provide highly-priced rents to entrepreneurs, the values of which gradually diminish as the newness becomes routine and established practices and the rarity vanishes. That explains how Schumpeter (1942) introduces the notion of creative destruction, where the initial rents are highly priced as natural consequences of the risky initiatives entrepreneurs undertook while the underlying entrepreneurial insights are subject to self-destruction as knowledge accumulates and diffuses.

At this junction, a natural question arises: how could an innovation (or equivalently a set of activities that would later lead to exceptionally added value) appear? According to Ridley (2016), a new innovation appears when particularly smart people suddenly and randomly hit on some bright ideas. And based on (Ye et al., 2012), innovative ideas on how to create demand-side synergies stem from some particular individuals’ intimate understandings of consumers’ wants and their imaginations to visualize a novel collocation of commonly available resources. In short, these studies based on anecdotes suggest that innovation in general appears randomly and are created by extremely intelligent individuals who just happen to be at the right place at the right time. To the contrary of this understanding on the appearance of innovations, and to fully understand what is in the play, let us cite the following game-theoretic result:

**Theorem 1** (Forrest et al., 2017). In the Nash equilibrium, a sufficient and necessary condition for at least one new enterprise to enter an oligopoly market competitively and profitably is that the consumer surplus $\beta$ is greater than or equal to the size of the loyal consumer base of an incumbent firm, where the so-called consumer surplus consists of all those consumers who make purchase decisions based on whose price is lower.

This theorem provides the theoretical foundation for why Schumpeter (1934) highlights the importance of entrepreneurs and emphasizes on innovations and services produced by creative combinations of available resources. In particular, based on their respectively dissimilar backgrounds and varied cognitive abilities, different entrepreneurs receive an identical set of market invitations, as signaled by increasing magnitudes of consumer surpluses in various product markets, differently. So, each of these entrepreneurs comes up with his/her own solution(s) with the belief that his/her particular product(s) will meet the market challenge. Such collective push for new products by entrepreneurs helps produce creative and efficient uses of available resources while discover new and substitute resources. At the same time, these new products intensify the competition in the marketplace, forcing
the incumbent firms to improve their existing products and to introduce new offerings. That is, it is entrepreneurs, acting individually, who constantly rejuvenate the market by providing forever renewing energies and opportunities of value creation.

Therefore, based on what is discussed in this section, each innovation can be seen as a set of purposeful activities designed to meet a recognized market demand, large or small. The importance of technology in innovation is manifested through the roles it plays, such as making production more efficient and discoveries more targeted, overall expenditure greatly reduced, etc. As pointed out in the previous paragraph, entrepreneurs, their individually different innovations developed on their dissimilar receipts of each and every market invitation and relevant discoveries of new resources lead jointly to transformations of markets and industries, and hence to economic development.

**Proposition 1.** In a market of free competition, the more effective protective property rights and complementary assets are, the more potential innovations have to create value.

In fact, based on the discussion above, it can be seen that free competition encourages people to behave entrepreneurially. If, additionally, protective property rights are effectively reinforced and complementary assets can be mobilized with efficiency, then the enthusiasm for market participants to innovate will be greatly heightened. For further supporting evidence, see (Teece, 1987).

**Proposition 2.** In a market of free competition, market exchanges make latent value that naturally exists in resources practically materialized.

In fact, this result is a corollary of Theorem 1, where the existence of the assumed oligopoly market that allows free competition is the key for consumers to constantly develop their preferences and forever changing tastes. These developments in consumers inevitably increase the magnitude of the consumer surplus, which in turn intensifies the market competition. That is how dormant value in resources becomes visible and developed through entrepreneurs’ creative combinations of their correspondingly available resources. For relevant empirical support of this proposition, see (Moran & Ghoshal, 1999).

As for what environmental and internal factors could potentially determine the innovativeness of a firm, see (Becheikh et al. 2006; Hitt & Ireland, 2000) and references listed there for relevant details.

**Proposition 3.** The circulation speed of information determines the speed of creative destruction.

To see why this proposition holds true, let us first look at how information plays its role in economic development over time. At the time when people still lived in primitive conditions, people naturally made their living by utilizing whatever available within their environment. That is when each family produced everything necessary for survival themselves. When the information of various self-made products, what they were for, who could make them and how they could be made, started to circulate from one family to another, from one tribe to another, and from one location to another, the quantity and quality of products began to improve and knowledge started to accumulate. So, the exclusively family-based workshops started to appear in order to satisfy the emerging demands from other families, other tribes and other locations, leading to the germination of local commerce. With information moving faster and over longer distances, orders came in from further out places; and correspondingly, products needed to be shipped across lands and waters. That encouraged the technology of transportation and communication to develop and evolve rapidly, making relatively isolated local markets more connected through long-distance shipments of goods and movements of information and knowledge. Consequently, the
originally disconnected workshops, which were mostly family-based, became more associated by supply chains. With goods, information, and knowledge travelling throughout and within individual regions, family-based workshops started to serve respectively their corresponding regional markets, pushing consumer demands to yet another higher level. Such increasing market demands motivate the family-based workshops to advance into factories equipped with relatively more advanced technologies. On such basis of economic development, large scale industrial revolutions started to appear one after another, accompanied by worldwide spread of information and knowledge of know-hows (Wen, 2016). In short, the entire economic history has witnessed how powerfully accelerating transmission of information has influenced the economic growth of business enterprises (Sobel, 1999), be they as large as the world economy or as small as an individual firm.

Now, by definition creative destruction stands for such a process of how an organization evolves through relentlessly revolutionizing its structure, either organizational or economic or cultural, from within so that the old structure is destroyed and new one created incessantly (Schumpeter, 1942). By continuing the previous discussion, it can be seen that the forces that drive the relentless revolution of an organization’s structure is the receipt of new information and knowledge and the organization’s desire for survival and growth. So, these driving forces are increasing functions of the circulation speed of information. That is, the faster information circulates the more rapidly the organization needs to revolutionize its organization, and consequently the faster creative destructions appear.

As an application of Proposition 3, let us look at the current internet-based e-commerce. Because the internet provides a world-wide communication network, all traditionally regional economies are emerging into a giant system of world markets, where delivery for the most part is not an issue. At the same time, virtual markets emerge, which pave the path for the traditional commerce to be reconfigured creatively or revolutionized. By employing the vast amount of openly shared information, new opportunities for value creation appear at both the supply side and the demand side for innovative entrepreneurs (Ye, et al., 2012). At the same time, virtual markets provide unprecedented opportunities for entrepreneurs to collaborate in new forms that involve firms across diverse product markets and long distances, players within a supply chain, and consumers, be they existing or potential. Such unprecedented opportunities of collaboration inevitably help firms create and capture values that transcend traditionally defined boundaries of firms and industries. Combining what is described here, Proposition 3 implies that in the current era of internet-based e-commerce the speed of creative destruction in all traditional areas of business will accelerate until the full potential of the internet system is reached.

By a transaction, it means a trade where a product is transferred across a technologically separable interface so that a stage of production and delivery terminates and another one starts (Williamson, 1983). By transaction cost, it means the cost of making a trade within a market (Demszet, 2003), where ‘trade’ represents not only the commonly known cases of buying and selling but also daily emotional interactions, informal gift exchanges, etc. Without specific mentioning, this paper will not derive results from the much broader definition of transaction costs given by Cheung (1992).

Generally, institutions, seen as a set of rules followed by trading members in a society, are the key in determining the magnitude of transaction costs. And such factors as frequency, specificity, informational asymmetry, uncertainty, limited rationality, and opportunistic behavior in small-numbers situations, are all important determinants of transaction costs (Williamson, 1979). So, firms that are able to facilitate low transaction costs can readily
increase their growth and improve performance (North, 1992). If a firm’s ability to reduce its transaction costs more than its competitors is referred to as transaction efficiency, then the following result holds naturally.

**Proposition 4.** A firm’s transaction efficiency represents a source of value that can be created for consumers and captured by the firm.

In fact, this result is a corollary of Theorem 1, where a firm’s transaction efficiency directly leads to lowered selling price of the firm. That in turn helps the firm to first maintain its loyal consumers and second attract the entire market segment of consumer surplus. This end realistically means that the firm created value for consumers and captured value for itself. Practically, business enterprises have well aware of the importance of lowering costs and risks of coordination and transaction and the potential of how information technology can help reduce them (Clemons & Row, 1992). And how transaction costs can be reduced by utilizing the internet or any highly networked environment is also recognized (Dyer, 1997).

Combining what is discussed above and this proposition shows that value creation and capture can be derived from the attenuation of such determinant of transaction costs as informational asymmetry, uncertainty, complexity, limited rationality, and bargaining behavior in small-numbers situations. So, companies that are capable of economizing on transaction costs by means of innovation are expected to extract values from their transactions with others. At the same time, improving reputation, trust and transactional experience, such as frequent transactions, can lower the cost of idiosyncratic exchanges between firms; that in turn improves a firm’s transaction efficiency.

**VALUE CREATION AS CONSEQUENCES OF INDIVIDUALLY UNIQUE SYSTEMS OF RESOURCES**

By resource, it stands for an asset, which is either tangible or intangible (Harmancioglu et al., 2009), a firm can mobilize to introduce and implement its strategies (Barney & Arikan, 2001) in order to accomplish its business objectives. By capability, it refers to a generally information-based process, either tangible or intangible, which empowers a firm to organize its resources in its effort of reaching its business objectives (Makadok, 2001).

**Proposition 5.** A firm’s specific capabilities also represent that firm’s resources.

When each and every firm is seen as a system of resources, where the word ‘system’ means that the resources are organically associated to each other for specific business purposes, then we have the so-called resource-based view or theory (RBV) of the firm (Kozlenkova, et al., 2014). This RBV can be formally developed on three basic axioms (Forrest et al., to appear):

**Axiom 1 (Resource Heterogeneity):** Different firms possess different systems of available resources, even when firms operate within the same industry.

**Axiom 2 (Resource Immobility):** These differences in systems of available resources may persist, because of practical difficulties of trading resources across firms and of connecting available resources in particular ways.

**Axiom 3 (Different Levels of Efficiency):** Performance differences in firms stem from differences in their systems of available resources and intrinsically different efficiency levels of available resources.

A resource is seen as valuable to a firm (Barney, 1997), if it enables that firm to increase its profits by employing a specifically designed strategy through considering external
opportunities and threats beyond what would be the case without the resource. Now, by relating the RBV to the concept of value creation, the following result follows:

**Proposition 6.** If a firm controls and is able to mobilize a system of valuable resources that few other firms share, then this firm will be capable of creating values.

In fact, the truthfulness of this result comes from the assumed scarcity of resources and the firm’s ability to make use of its scarce resources. As a consequence, this firm will be able to develop its particularly sustainable competitive advantages that few other firms can compete with successfully before the scarcity disappears.

**Proposition 7.** If a firm supports the exploitation of its valuable and rare resources through well-developed policies and implemented procedures, then the firm will be able to create additional values.

This result is a corollary of Proposition 6. And, empirically, Morgan et al. (2009) provide support for this result when they show that if brand management resources are employed appropriately, firm performance improves. And, Zheng et al. (2010) witness that positive firm performance is dependent on effective integration of relevant policies and procedures into the organizational culture.

**Proposition 8.** If a firm controls a set of resources that are simultaneously valuable and rare, while the interests of the management and shareholders are consistent, then this firm will be able to sustainably create value by mobilizing these resources.

In fact, the supposition that the management and shareholders have consistent interests indicates that the said resources can be and will be effectively exploited by the firm. So, Propositions 5 and 6 imply that this firm will be able to sustainably create value by mobilizing these resources.

**Proposition 9.** An adequate interaction among such capabilities as marketing, research and development (R&D) and operation potentially leads to value creation for a firm.

In fact, a firm’s marketing capability connects the firm and the market through showing what the firm is, what it can accomplish and what the product market demands for. It helps the firm by providing what the firm needs to know and can expect in terms of its current and expected competitions (Kotler & Keller, 2016; Jaworski & Kohli, 1993). That is, the firm’s marketing influences the firm’s innovative orientation and presents the firm to the market.

As for the firm’s R&D capability, it translates the vital market information, acquired through marketing, into designs and production of relevant products that potentially meet consumers’ evolving demand. And it creates difficulties for competitors to imitate the newly introduced products (Irwin & Klenow, 1994). When the firm’s R&D has a strong, reputable track record, the R&D capability helps the firm enhance its image and favorable consumer expectations.

In terms of the firm’s operational capability, it practically materializes the knowledge acquired by marketing and R&D’s ideas of new products into deliverable offers.

When the knowledge gained from marketing is original, the R&D ideas of new products are innovative and the relevant operations are complex and accommodating, jointly making the entire chain of activities imperfectly mobile and imperfectly imitable, the firm will consequently create values (McGrath, 2013; Hayes, et al., 1988). In other words, the result in Proposition 9 follows directly from Propositions 5 and 6.

Summarizing what are established above, we see from the point of view of the RBV that marshalling a system of specialized resources, which are valuable and scarce, may potentially lead to value creation. In other words, when firms are identified as individually unique systems of resources, the services derived by a firm from its valuable and rare
resources may potentially lead to value creation. This end in fact has been established more or less empirically (Amit & Schoemaker, 1993; Barney, 1991; Peteraf, 1993; Wernerfelt, 1984) since over sixty years ago when Penrose (1959) first noticed how important organizational resources are to the success of business firms.

In the previously defined concepts of resource and capability, if they are seen as time-dependent or functions of time, then a general resource-based theory of firm evolution can be readily developed. For example, the scarcity of a resource is clearly time dependent and changes with time; the practical worth of $1 million investment depreciates over time; a current inimitable resource gradually becomes imitable as time elapses. By combining this discussion with Proposition 5, it follows that each capability can be naturally seen also as time-dependent and a function of time. Hence, the concept of dynamic capability (Teece et al., 1997) becomes a special case of that of capability defined earlier.

With time being involved, the consequent resource-based theory can now naturally and simultaneously address such questions as how values are appropriated, how competitive advantages can be possibly sustained (McGrath, 2013; Barney, 1991), and how positions of valuable resources are constructed and acquired over time.

Treating a resource and/or a capability as a function of time is not simply a mind exercise. Indeed, it is rooted deeply in the fact of how firms’ operations consist mostly of managerial and organizational processes, be they aimed at forming coordination, accomplishing integration, materializing a revitalization, or necessitating a transformation (Teece et al., 1997; Eisenhardt & Martin, 2000), or learning (Lei, Hitt, & Bettis, 1996). It is these time-dependent resources/capabilities, such as strategic decision-making, knowledge acquirement, product development, how-to skill creation, social network formation, etc., that enable firms to create and capture value through the so-called Schumpeterian rents (Teece et al., 1997).

**Proposition 10.** Virtual markets provide brand new opportunities for value creation and capture while makes the sustainability of newly created value reduced.

In fact, the widely available internet that underlies the operation of virtual markets makes financial exchanges convenient and readily accomplishable. It provides a constantly available platform for entrepreneurs to exploit resources and to explore potential complementarities among resources of different kinds. That explains (Proposition 2) why virtual markets provide brand new opportunities for value creation and value capture. On the other hand, the internet also provides timely information sharing that is either free of any charge or very low priced. The rapid circulation of knowledge, according to Proposition 3, explicates why the sustainability of newly created value is reduced.

VALUE CAPTURE THROUGH MUTUAL FORBEARANCE, SUPPLY-CHAIN NETWORK & STRATEGIC BLOCKS

In the modern world economy other than autonomous firms that compete against each other in the marketplace for advantages in general and for profits in particular, what is more prevalent is how firms, as parts of inter-organizational networks, collaborate with each other both socially and professionally (Galaskiewicz & Zaheer, 1999). By a strategic network, it means a stable network of inter-organizational ties that are strategically significant to all partner firms (Gulati et al., 2000). For example, each firm is a natural input-output system; so it is a part of an ecosystem network, consisting of upstream components and downstream complements (Adner & Kapoor, 2010). Here, suppliers represent some of the upstream
components of the focal firm; customers, supporters and assistants who help to make the product of the focal firm usable by consumers are the downstream complements. Although supporters and assistants are outside the focal firm’s direct supply chain, they need to invest and develop new infrastructure to make the focal firm’s product practically usable by the ultimate consumer.

Empirically, other than access to information, markets, and technologies (Gulati et al., 2000), strategic networks also provide opportunities of risk sharing, economies of scale and scope (Shapiro & Varian, 1999), knowledge sharing, and advanced learning (Dyer & Nobeoka, 2000). Additionally, they help their member firms to reap the benefits resultant from symbiotic activities (Blankenburg et al., 1999).

Proposition 11. When the incumbent firms in an oligopolistic industry jointly reach a state of mutual forbearance, these firms enjoy relatively sustainably increased profitability. In fact, a state of mutual forbearance represents such a situation that incumbent firms alleviate their rivalry by partitioning the market into respective segments in proportion to individual firms’ strengths (Bernheim & Whinston, 1990). Each incumbent firm surrenders its dominance to stronger competitors in those market segments where it is less efficient (Li & Greenwood, 2004). Therefore, the firms gradually become codependent on each other, which motivates them to curb their rivalries (Yu & Cannella, 2012). As a consequence, the number of entry into and exit from the market decreases (Fuentelsaz & Gómez, 2006), while interfirm hostility eases (Haveman & Nonnemaker, 2000).

Because of their great concentrations of dominance, market power relative to upstream components and downstream complements, and deepened extents of collusion, tacit, etc., these incumbents exert a pervasive influence on the profitability of this industry. At the same time, any entry of new firms into the industry is hampered by strongly fortified barriers. Therefore, these firms’ profitability, increased from that before reaching the state of mutual forbearance, can be relatively sustained. The word ‘relative’ means that the profitability can be sustained until such a time when the incumbents can no longer keep up with the evolving preferences and tastes of consumers (Theorem 1).

Empirically, this result is indirectly supported by Scherer and Ross (1990) and Galaskiewicz and Zaheer (1999) when they show dense or strong ties among firms within an industry may be conducive to oligopolistic coordination, tacit or otherwise. And Podolny (1993) confirms how top-tier banks use their ties to sustain the high returns of that industry.

Assume that $S = (M, R)$ is a connected system and $m \in M$ an object satisfying $S' = (M - \{m\}, R\{|M - \{m\}\}) = S_1 \oplus S_2$, where $S_i = (M_i, R_i)$, $i = 1, 2$, is a connected system and $M_1 \cap M_2 = \emptyset$. Then the object $m$ is referred to as a (systemic) hole of the system $S$. To understand this concept intuitively, let $S = (M, R)$ model the systemic structure of a complete supply chain with the top most upstream players being the providers of raw materials and the bottom most downstream players being the consumers. In particular, in this systems’ modeling the object set $M$ consists of the set of all players in the supply chain, be they suppliers or producers or consumers, and the relation set $R$ describes how these players are associated with each other based on how their corresponding inputs and outputs are connected into each other, say, players $m_1$ and $m_2$ are associated if the outputs of $m_1$ are the inputs of $m_2$ either directly or indirectly. Then, a player $m \in M$ is a hole in this system $S$, provided that when this player is removed from the supply chain, the system $S$ will break into two disjoint and incomplete supply chain systems $S_{\text{upstream}} = (M_{\text{upstream}}, R_{\text{upstream}})$ and $S_{\text{downstream}} = (M_{\text{downstream}}, R_{\text{downstream}})$.
where $M_{\text{upstream}}$ consists of all the components that are located in the upstream of $m$ and $M_{\text{downstream}}$ all the complements in the downstream. In this case, neither of these two sub-supply chains $S_{\text{upstream}}$ and $S_{\text{downstream}}$ are complete, because the outputs of the former cannot eventual reach the demands of the latter. Speaking in business terms, in an industry’s customer-and-supplier network, if two industrial trading partners can only complete their trades through a focal industry, then this focal industry is a systemic hole in the underlying supply-demand network. The concepts of systemic hole $m$, supply-chain system $S$, and the disjoint subsystems $S_{\text{upstream}}$ and $S_{\text{downstream}}$ are depicted in Figure 1, where arrowed curves stand for the input-output flows of the supply chain.

Proposition 12. Each systemic hole within a supply-demand network convenes power and profitability due its locational advantage of control.

In fact, each supply-demand network can be described as a connected system $S = (M, R)$ with $M$ being the set of all players in the network and $R$ describing the supply-and-demand relationship of the players. So, for each systemic hole $m \in M$, its locational advantage can potentially cut $S$ into two disjoint subsystems $S_{\text{upstream}}$ and $S_{\text{downstream}}$, as defined previously, so that nobody in the bottom most layer of $S_{\text{upstream}}$ can find any buyers for its products, while nobody in the top most layer of $S_{\text{downstream}}$ can offer their outputs to consumers due to a lack of necessary supplies. In other words, $m \in M$ has the controlling power of determining the very survival of its upstream components and downstream complements. That power of life naturally leads to profitability.

Empirically, Burt (1992) shows that industries that occupy the position of systemic holes are able to enjoy good returns through appropriating over-weighted proportional large shares of resources.

Proposition 13. The membership in such a supply-chain network that enjoys an expanding base of consumers boosts a focal firm’s profitability through improving its location in a broader network of resource flows.

This conclusion is really a corollary of Theorem 1. As a matter of fact, the assumption that the said supply-chain network enjoys an expanding base of consumers implies that its market share is not being eroded by either new or existing competitors (Theorem 1), while it is attracting additional businesses over time. That of course helps boost the focal firm’s position in the marketplace and consequently its profitability.

Conversely, when the consumer base of a supply-chain network dwindles, the focal firm’s location in broader network of resources and profitability are affected adversely. For example, a contracting national military directly depresses the fortunes of defense contractors.

Assume that formal systems expression $S = (M, R)$ is a symbolic representation of an industry such that each object $m \in M$ stands for a firm within the industry and each firm of the industry is also an object in $M$. If $S = \bigoplus_{i=1}^{n} S_i = S_1 \bigoplus S_2 \bigoplus \ldots \bigoplus S_n$ such that $S_i = (M_i, R_i)$ is a connected system and $M_i \cap M_j \neq \emptyset$, for any $i, j = 1, 2, \ldots, n$, satisfying $i \neq j$, then each system $S_i$ is referred to as a strategic block within the industry by borrowing the terminology from Nohria and Garcia-Pont (1991) when they studied the global automobile industry. In other words, each block $S_i$ represents a group of firms that form an alliance with each other but not to others in the industry.

Proposition 14. Membership in strategic blocks of an industry generally leads to a varied level of profitability among the firms in the industry. And, the membership in a strategic
block that enjoys an expanding market influence carries a positive effect on a focal firm’s profitability.

In fact, the first conclusion follows from the fact that each block employs an individually specific strategy with its particular emphasis. So, different strategic blocks affect the market differently. This end naturally leads to different levels of blocks’ profitability. That consequently causes firms within different blocks to enjoy different levels of performance. The second conclusion is a direct corollary of Proposition 13.

Empirically, this result is independently confirmed by Piskorski and Nohria (1999), Zaheer and Zaheer (1999) and Baum et al. (2000). In particular, Piskorski and Nohria study strategic networks within the venture capital industry and finds significant differences in profitability among firms depending on which strategic blocks they belong to. Zaheer and Zaheer look at the interactions between banking firms in order to assess the competition in the global currency trading industry. And Baum et al. find that the performance of startups in biotechnology industry can improve if they configure alliances into networks so that they can tap into the capabilities and information of their alliance partners by using the Canadian biotechnology industry.

VALUE IN INTER-ORGANIZATIONAL NETWORKS & DIRECT SELLER-BUYER PLATFORMS

Continuing the previous discussions, this subsection focuses on the benefits of a firm’s membership in an inter-organizational network and a strategic block and how a firm could benefit from creating a network or platform that establishes communications directly between sellers and buyers.

**Proposition 15.** For a focal firm, its particular membership and association with other firms within an inter-organizational network or a strategic block generally stand for resources that are inimitable and not readily substitutable that firm can potentially mobilize.

In fact, Propositions 10 – 13 jointly explain the reason why this proposition holds true by demonstrating why networks and strategic blocks are important for firms: Inter-organizational networks help incumbent firms to maintain their profitability and boost their locational advantages in broader network of resource flows, while intra-industrial strategic blocks provide firms more or less relatively sustained levels of profitability. Additionally, networks may serve as entry barriers for firms trying to enter an industry, while strategic blocks create mobility barriers for firms trying to cross strategic groups, either entering or leaving or both. That is, networks and strategic blocks represent both opportunities and constraints for incumbent firms.

More theoretically, this proposition is supported by Theorem 1. In particular, the theorem says that when there is a demand in the marketplace, the market will signal invitations for additional competitions and innovations. However, firms receive the invitation differently due to their varied backgrounds, available resources and cognitive abilities. When the smart R&D minds of the firms develop their corresponding solutions to answer the market call, each of these firms demands its upstream suppliers to provide compatibly appropriate innovations and supplies and their downstream complementors to offer different supports and assistances in order to successfully push their products into the hands of the eventual consumers (Adner et al., 2013). These differences in recognizing market signals, in available resources, and in demands on suppliers and complementors make a firm’s membership and association with other firms within its inter-organizational network
and strategic block inimitable and not readily substitutable resources that firm can potentially mobilize and enjoy.

In terms of the literature, Gulati et al. (2000) suggest a related conclusion; and in terms of real-life practices, a firm’s network and strategic block provide the firm with specific access to key external resources, such as relationships, information (Gulati, 1999), knowledge, alertness and responsiveness (Zaheer & Zaheer, 1997), opportunities (Westney, 1993), capital, goods, services, technology, etc., which all have the potential to enhance a firm’s competitive position in the marketplace (Becheikh, et al., 2006). And because such network and strategic block are idiosyncratic and developed through a historical path dependent process, they are difficult for competitors to imitate or substitute (Gulati & Gargiulo, 1999). This once again shows why a firm’s membership and association with other firms within its inter-organizational network and strategic block represent inimitable and not readily substitutable resources that firm can enjoy and potentially mobilize.

By opportunism, let us define it as an observant policy and resultant advantage taking of circumstances driven primarily by self-interested motives without being constrained by the underlying principles and without considering consequences for others. The key in this definition is the “advantage taking of circumstances” regardless the underlying principles, which exist assuredly with people either individually or collectively (Lin & Forrest, 2011). Hence, no matter what specific case and context are concerned with, the scenario takes place within and on top of a set of assumed values that dictate what behaviors are considered right, acceptable and which are ruled wrong and immoral. That explains why although the marketplace that allows for free competition provides no universal standard of morality except laws and regulations regarding contracts and transaction settlements, opportunism and opportunistic behaviors can still be quite easily detected by comparing what is taking place against relevant norms or principles. This discussion not only explains the concept in further details but also in fact clears the difficulty of defining this concept of opportunism as claimed by Chen et al (2002).

Proposition 16. Inter-organizational networks across industries and strategic blocks within one industry generally enhance firm-level trust, reduce informational asymmetry, and make opportunism costly.

In fact, by firm-level trust, it means the confidence that one firm will not exploit the vulnerabilities of the other firms (Barney & Hansen, 1994). Each business transaction occurs within a history of prior associations, either direct or indirect, and a broader network of relationship. That makes networks and blocks important resources and origins of referrals, while firms’ reputation is the basis of each and every referral. At the same time, although reputation generally takes time to build, it can be ruined quickly. Therefore, a firm’s membership in an inter-organizational network and a strategic block obligates the firm to behave appropriately in terms of the norms and principles of the network and block. This discussion proves why inter-organizational networks and strategic blocks generally enhance firm-level trust and make opportunism costly.

As for why such networks and blocks help reduce informational asymmetry among their member firms is because the very nature of networks and blocks enables these firms to know each other very well due to strengthened business ties and frequent business interactions in terms of their respective capabilities, resources and vulnerabilities.

In terms of literature, this proposition is initially established, although stated differently, by Gulati et al (2000).
Because enhanced firm-level trust, reduced informational asymmetry and increased opportunism cost all help lower transaction costs and address appropriation worries, the following conclusion follows naturally.

**Proposition 17.** Inter-organizational networks across industries and strategic blocks within one industry generally boost the value creation of their member firms.

By borrowing the idea of strategic networks across industries and that of strategic blocks within an industry, one such network can be established right within the product marketplace that directly connect competing sellers with buyers, be they bargain hunters or not, where a focal firm plays the role of systemic hole between sellers and buyers. Graphically, Figure 2 depicts such a direct seller-buyer network with firm \( m \) being the systemic hole. So, the following result follows naturally.

**Proposition 18.** By offering a convenient platform for each buyer to reach multiple sellers simultaneously and vice versa, a focal firm creates value for both sellers and buyers and can capture its share of value handsomely until similar platforms become widely available.

This result follows from the fact that in the marketplace finding decided buyers represents a great challenge for sellers due to the availability of similar products and substitutes, while locating willing takers of bargaining bid prices denotes a major struggle for buyers (Forrest & Anderson, 2017). In such direct seller-buyer interactions provided by the said convenient platform, as described here, all involved parties are able to save on their search and information costs, bargaining costs and policing and enforcement costs. So, when such a platform that connects each bid price to multiple sellers and each offer to multiple buyers is developed and offered, the focal firm creates value for both sellers and buyers. At the same time, the capture of handsome value by the focal firm will continue until it is no longer a systemic hole in the direct seller-buyer network (Proposition 12) when the total value that can be potentially captured has to be shared among many firms that offer similar platforms.

And Proposition 4 also provides support for this conclusion, because each convenient platform that helps connect sellers and buyers in multiplicity improves the transaction efficiency of the firm that operates the platform.

In practice, such a platform that directly connects sellers and buyers has been developed by priceline.com. The company passes on desired prices of consumers directly to potential sellers. When a willing seller accepts a bid price, the item, such as an airline ticket, is sold over the internet. To protect its way of business transactions, the firm actually obtains a patent for its innovative business method, distinguishing itself from other online travel agencies (Amit & Zott, 2001).

**GENERALIZED VALUE CHAIN FRAMEWORK**

By the value of a product, it means how much consumers are willing to pay for that product or the total revenue generated by the product. So, a firm is profitable only when the revenue from its product(s) is greater than the costs of producing and delivering the product(s) (Porter, 1985).

By value driver of a business, it means a factor that enhances the business’ total value (Amit & Zott, 2001), which is equal to the sum of all values captured by the participants of transactions in the business (Brandenburger & Stuart, 1996).

With these basic concepts defined, we can now generalize Porter's (1985) value chain framework based on the discussions in the previous sections as follows. So, the resultant
model will be useful for analyzing value creation at the firm level, no matter whether the
firm of concern produces physically tangible product(s), offers physically intangible but
worthwhile services, or delivers information product(s) that is very much demanded by
consumers.

Innovatively understand what market is signaling,
Appropriately define the strategic direction for a firm,
Practically identify the key activities that will move the firm in the desired direction,
Adequately define the products that meet market demand(s), and
Reasonably determine the values to be created and captured out of each activity.

Based on this framework, the leadership of a firm first collects and understands what the
market is signaling (Theorem 1) so that a strategic direction that is adequate in terms of what
is available to the firm and what the firm is capable of can be defined (Forrest et al. 2017).
Second, along the strategic direction, the leadership identifies the essential activities the firm
needs to embark on in order to materialize the adopted strategy. Third, the leadership makes
sure that suitable product(s) is designed in order to answer the market call. And fourth, the
leadership investigates the economic implications of those activities and evaluates the
appropriateness of the imagined products in terms of value creation and capture. Then,
appropriate new products are produced and offered to meet the market demands.

In particular, when there is a specific consumer demand, the market actually sends out
invitation to all potential participants, be they incumbent or not, of the market for further
research and development (R&D) and for introducing respectively innovative products
(Forrest et al. 2017). With different backgrounds of knowledge composites and diverse
human abilities to comprehend, it is critical for a firm to creatively understand what the
market is telling and then define the corresponding strategy and following steps of action for
the purpose of materializing the specific understanding of the market (McGrath, 2013). In
other words, in the previous list of 5 steps of the value chain framework, the first is the most
fundamental step, on which the rest are developed; and before anything else, preliminary
studies on these steps need to be conducted first. Such studies specify what market signal is
received by the firm, what should be internally implemented based on the newly acquired
knowledge regarding the market demand, how the uncovered market demand can be met,
and what will be delivered to the marketplace. In terms of managerial planning, this
framework helps address the following main questions:

What should a firm do and how? And
What would be the configuration of the conceived activities that would enable the firm
to add value to its product(s) and to compete in the marketplace?

In particular, the ‘what’ question in (i) addresses many issues, such as what to
innovatively design and produce, what method(s) of production to adopt, etc. And the ‘how’
question looks at such matters as ‘how distribution networks should be constructed?’, ‘how
marketing campaigns need to be carried out?’, ‘which new market territories could be
entered?’, and ‘in which ways should the overall business be run?’. In short, answers to these
questions will have to introduce novelty and improved efficiency. And, any appropriate
answer to question (ii) will implicitly address such issues as product complementarities and
the effect of lock-in. Here, product complementarity means the likelihood of bundling
different products together as a package for sale in order to provide more value than the sum
of selling each of the products separately (Mantovani, 2013; Sheikhzadeh & Elahi, 2013;
Yan et al., 2014). And the effect of lock-in means how consumers and business partners are
motivated to engage in repeated transactions. In terms of sources of value creation in e-
business, such factors as efficiency, complementarity, novelty and the lock-in effect are empirically identified by Amit and Zott (2001) as four major value drivers.

Any investigation based on this generalized value chain framework will be referred to as a value chain analysis. It explores a firm’s primary activities that will have a direct impact on its value creation, and support activities that affect the expected value through their bearings on the performance of the primary activities. The identified primary activities lead to the creation of innovative products and include related internal logistics, operational and production procedures, outbound logistics, marketing, sales, and services.

Based on how the concept of products is defined above, other than manufacturing firms value chain analysis can be naturally employed to examine opportunities of value creation and capture in virtual markets and to study service firms. In other words, our value chain framework truly generalizes that initially developed by Porter (1985), which is more suitable for the analysis of production of physical products and manufacturing firms (Stabell & Fjeldstad, 1998). It includes Rayport and Sviokla’s (1995) virtual value chain, which consists of a sequence of gathering, organizing, selecting, synthesizing, and distributing information, as a special case. In this virtual value chain, the first step – gathering information – is really parallel to the acquirement of raw materials for the case of manufacturing firms. The second step – organizing information – is parallel to the initial processing of raw materials. The third and four steps – selecting and synthesizing information – are the steps of making the eventual information goods. And the step of distributing information is pushing the already-made products onto the marketplace. In other words, Rayport and Sviokla’s (1995) virtual value chain stands for a small portion of the contents of our value chain framework so that it is indeed a special case of the latter. In particular, for an e-enterprise of the virtual market, it is still crucially important for it to creatively understand market signals and define its strategic direction while targeting the market demand; then identify the key activities, which will surely include gathering, organizing, selecting, synthesizing, and distributing information. And before investing hugely, it needs to determine the values it will create and capture out of each activity. That is, our value chain framework needs to be followed exactly with adequate interpretations.

What is discussed in the previous paragraphs indicates that our value chain framework may and will naturally point to value creation opportunities that combine informational and physical (and intangible and tangible) products, on-site and off-site services, creative configurations of transactions, reconfiguration/combination of resources, and relationships among suppliers, stakeholders and customers. For example, many traditional brick-mortar businesses now have e-commerce components through increased processing of information flows, while established e-enterprises develop their brick-mortar outlets to accelerate the speed and reliability of the delivery of products ordered online.

In our value chain framework, the total value is created parts by parts throughout each and every of the steps by introducing and offering differentiated products, which either decrease costs for consumers or raise consumers’ utilities or both. The driver of value creation is solely seated in product differentiation. That is the result of adequately recognizing the market invitation and adopting appropriate strategies, which dictate what activities to carry through and how they should be conducted. The adopted strategies establish associations, such as timing, location and sharing of responsibilities, between activities, among suppliers and channels and among business units.

CONCLUSIONS
To grow and to succeed in the present turbulent world of business, firms have to constantly look for unconventional opportunities to create value and to capture value (McGrath, 2013). As a global phenomenon, the number of enterprises that conduct business transactions within virtual markets have been growing exponentially (Forrester Research Report, 2000). That is, with the development of technology rules of competition are changing, methods of matching sellers and buyers are becoming almost costless, systems of buyers’ order placement and sellers’ product delivery are advancing with forever increasing fluidity (Amit & Zott, 2001). So, to face such a challenge of speedy changes both academically and practically, this paper generalizes the well-received value chain framework originally developed by Porter (1985) as the basis for analyzing and investigating production and manufacturing firms so that our new framework can be equally applicable to firms that offer either physically tangle products, or services or informational goods. Other than its theoretical value, this new framework will provide managers a reliable tool for their decision and policy making.

To establish the imagined new framework successfully, this paper looks at the overall landscape of the fast changing world of business from several different angles based on logic reasoning and systemic thinking. In terms of market competition, we explore theoretically how consumer markets signal their invitation for improved and new products and how the speed of creative destruction is accelerated. In terms of innovations, we find when they will provide additional potential for value creation. In terms of resources, what is established herein shows when their latent values can be practically realized through value creation. In terms of networks, be they across several industries or within one industry, this paper demonstrates why a state of mutual forbearance leads to relatively sustainably increased profitability, how a firm’s systemic hole position provides the firm with advantages and profitability, and why the membership in a strategic block of increasing market influence positively affects a firm’s profitability. In terms of direct association of sellers and buyers, this work shows that by creating convenient platforms a firm can readily create values and capture values.

As for practical significance, this paper provides generally useful recommendations for entrepreneurs, managers, and retailers, respectively. In particular, for entrepreneurs, this paper shows the critical need for them to recognize market signals in their individually different ways. So, they can consequently design and introduce their idiosyncratic products (Theorem 1 and the following analysis) while positioning themselves in systemic hole locations (Proposition 12). To increase their chances of success, this paper shows the reasons why they should consider joining such a supply chain that enjoys an expanding market territory (Proposition 13) and inter-organizational networks (Propositions 14 – 17).

For managers, they can increase the potential for their resources to create additional values by offering their employees relevant honors and financial incentives and by encouraging cross-team exchanges of ideas and sharing of resources (Propositions 1 – 3, 5). They need to introduce and adopt policies and implement procedures to develop and mobilize their firm-specific resources (Propositions 6 and 7) while aligning their interests with those of stakeholders (Proposition 8). And they need to base their decisions on joint recommendations from their marketing efforts, R&D achievements, and operational practicalities (Proposition 9). By doing so, the managers will be able to create value for consumers and capture value for their firms, while encouraging collaborations within their organizations. At the same time, to reach a state of forbearance with competitors, managers
need to join or organize inter-organizational networks (Propositions 13 – 17). However, even when their firms are in a state of forbearance with other competitors (Proposition 11), managers still have to push for innovations and introduction of new products. Otherwise, they may very well be left behind by new competitors (Theorem 1). If possible, managers should encourage such innovations that would position their firms at systemic hole locations within their respective supply-chain networks (Proposition 12).

For retailers, this paper recommends that they need to (1) constantly improve their transaction efficiencies (Proposition 4); (2) take advantage of whatever new convenience, such as internet, instant messaging, etc., technology has to offer (Proposition 10); and (3) introduce and regularly improve their platforms through which buyers and sellers can reach and communicate with each other conveniently and massively (Proposition 18).

To provide potential future directions of research along the lines developed in this paper, let us now look at the limitations of this work. In terms of methodology, there is a whole set of readily available tools for analyzing systems (or business organizations and their interactions) (Lin, et al., 2012). So, by making use of systems scientific methods beyond what is employed here, we expect to establish additional and finer theoretical conclusions that can be applied practically. Another obvious limitation of this work is the assumption on why a business firm actually exists. In fact, companies exist for various reasons. So, they behave widely differently according to why and how they are established. This end explains why theoretical results established in this paper are not universally applicable to many actual situations when firms of concern are not established to develop positive cash flows. That of course points to some research problems for the future: Develop similar results as what have been established above for each particular scenario of why a firm is founded.

**APPENDIX: TECHNICAL DETAILS OF SYSTEMS CONCEPTS**

For a given system $S = (M, R)$ and each relation $r \in R$, there is an ordinal number $n = n(r)$ such that

$$r \subseteq M^{n(r)} = \prod_{i=1}^{n(r)} M_i,$$

where $M_i = M$, for each $i \in n(r)$.

In other words, each relation $r$ in the system $S$ is a subset of the Cartesian product of $n(r)$ copies of the object set $M$. And for any subset $N$ of the object set $M$, the subsystem $S|N = (N, R|N)$ of the original system $S$ is defined as follows: For each $s \in R|N$, there is $r \in R$ such that

$$s = r|N = \{(x_i)_{i \in n(r)} \in r : x_i \in N, i \in n(r)\}.$$

In other words, the relation $s$ contains all those elements of $r$ such that all of their components belong to $N$.

For a set of systems $S_i = (M_i, R_i), i \in I$, where $I$ is an index set, if any two of these systems have disjoint object sets, then the free sum of these systems, denoted $\oplus \{S_i : i \in I\}$ or $S_1 \oplus S_2 \oplus \ldots \oplus S_n$, if $I = \{1, 2, \ldots, n\}$ is finite, is simply defined as follows:

$$\oplus \{S_i : i \in I\} = \left( \bigcup_{i \in I} M_i, \bigcup_{i \in I} R_i \right).$$

If the object sets of the systems $S_i = (M_i, R_i), i \in I$, might not be pairwise disjoint, then we can simply replace these systems by another set of systems $S'_i = (M'_i, R'_i)$ with pairwise
disjoint object sets such that the systems $S_i$ and $S_i'$ are similar, for $i \in I$. Now, the free sum of the system $\{S_i: i \in I\}$ is defined as follows:

$$\bigoplus \{S_i: i \in I\} = \bigoplus \{S_i': i \in I\} = \left( \bigcup_{i \in I} M_i' \bigcup_{i \in I} R_i' \right).$$

This explains why we can show the conclusion that for any set of systems, its free sum always exists uniquely up to a similarity.

For a given system $S = (M, R)$ and a relation $r \in R$, the support of $r$, denoted $\text{Supp}(r)$, is defined by

$$\text{Supp}(r) = \{m \in M: \exists x = (x_i)_{i \in n(r)} \in r \exists \beta \in n(r)(m = x_{\beta})\}.$$

Intuitively, the support of the relation $r$ is the set of all objects from $M$ that appear in $r$.

By using the concept of supports, the concept of connected systems is introduced as follows. A system $S = (M, R)$ is said to be connected, provided that the system cannot be written in the form of the free sum $S_1 \oplus S_2$ of two nontrivial subsystems $S_1$ and $S_2$ of $S$. Then the following result holds true:

**Theorem 2** (Lin, 1999). For every system $S = (M, R)$, the following statements are equivalent:

1. The system $S$ is connected.
2. For any two objects $x$ and $y \in M$, there is a natural number $n > 0$ and $n$ relations $\tau_i \in R$, $i = 1, 2, \ldots, n$, such that $x \in \text{Supp}(\tau_1)$ and $y \in \text{Supp}(\tau_n)$ and $\text{Supp}(\tau_i) \cap \text{Supp}(\tau_{i+1}) \neq \emptyset$, for each $i = 1, 2, \ldots, n - 1$.

REFERENCES


Figure 1. A systemic hole in a supply-chain network

Figure 2. A direct seller-buyer network
THE POTENTIAL POWER OF INTERNSHIPS AND THE IMPACT ON CAREER PREPARATION

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ABSTRACT

The educational community is tasked with preparing students for career-ready positions. Aligned with skill development and curriculum content, experiential learning has often proven beneficial for students to reinforce concepts and provide a transfer of learning and application. Internships, prior to graduation, seem to provide a win-win opportunity for the student in the form of real-world, experiential learning. The organization benefits by receiving additional resources at a reduced rate and an opportunity to determine whether the individual will be a good fit for the culture and the position. This paper will seek to explore this relationship to determine whether the outcomes are positive and may lead to increased job offers and quicker employability. In addition, this will include some research on the attributes of students who pursue internships.

INTRODUCTION

An internship is defined as ‘any official or formal program to provide practical experience for beginners in an occupation or profession, according to Dictionary.com. More specifically, The National Association of Colleges and Employers (NACE) describes an internship as “a form of experiential learning that integrates knowledge and theory learned in the classroom with practical application and skills development in a professional setting” (2018). These internships predominately provide an opportunity for undergraduate, graduate students and those changing careers to receive hands-on exposure to their chosen field of study or a new career, either in a paid or unpaid environment.

To provide some uniformity and standards, NACE has determined that these 7 criteria should be applied as a litmus test to be considered an internship:

- The experience must be an extension of the classroom: a learning experience that provides for applying the knowledge gained in the classroom. It must not be simply to advance the operations of the employer or be the work that a regular employee would routinely perform.
- The skills or knowledge learned must be transferable to other employment settings.
- The experience has a defined beginning and end, and a job description with desired qualifications.
- There are clearly defined learning objectives/goals related to the professional goals of the student’s academic coursework.
- There is supervision by a professional with expertise and educational and/or professional background in the field of the experience.
There is routine feedback by the experienced supervisor. There are resources, equipment, and facilities provided by the host employer that support learning objectives/goals (2018).

Many universities offer academic credit for students, whereby students work at the organization’s site for a number of hours equating to the number of class hours. For example, 3 academic credits would require 120 hours worked for the organization. If the internships are for credit, they are then supervised by a professional at the work site and an academic professional from the respective university. In this way, students are able to immerse themselves in a job site, test their respective skills, and apply concepts learned throughout their curriculum. Since universities have a primary goal to prepare students for career-ready positions, internships can afford students a site to apply their skills in their first real-world workplace. This experience can often be valuable for the students as they are afforded a new lens through which they can evaluate their chosen field of study, while also determining the pros/cons of the industry and the specific organizational culture of their chosen site. This time can be maximized if the student is given job-related tasks, projects, networking events and opportunities, etc. Jones, (2006) refers to this as previewing a profession. From an employer’s perspective, they can receive additional resources and a quick, inexpensive review of potential new hires for their future to fill their talent pipeline. This extended training period, often a college semester, can be mutually beneficial and can often translate into a job offer. If internships can serve as a competitive differentiator for employment after graduation, then universities may also want to review their respective policies and expand their programs and networks to include more external stakeholders and site locations.

**LITERATURE REVIEW**

In a 2016 Looksharp study entitled, *State of Millennial Hiring Report*, 21,000 students responded to questions regarding hiring by industry, location and business size. New entrepreneurial companies are beginning to realize the allure of interns while mid-size companies between 50 and 500 employees remain most popular for intern sites. Some other findings are listed below:

- Internships are a critical element in determining career success. There are strong correlations between having at least one internship and improved job prospects after graduation and finding employment in the respective field of study.
- Expectations after graduation may be unrealistic. There’s a $9,000 gap between college seniors’ salary expectations and actual starting salaries.
- Demand for internships is higher than supply. Among the 31.5% who said they had not completed an internship to date, more than 70% said they had searched unsuccessfully.
- According to this research, there is also a correlation between multiple internships and job placement. Graduates who fulfill the internship requirements for 3 or more sites are more likely to receive full-time job offers. Slightly over 81% of the interns responded that these experiences helped them either shift the focus of their majors/classes or adjust their career plans.

NACE published a 2016 Internship & Co-op Survey, that encompassed 20 industries and 271 different organizations. Key findings from the program section indicated that internship work responsibilities remain relatively unchanged and employers still prioritize
analytical and problem-solving duties first with project management and communications following. For outcomes in this portion of the study, employers’ singular goal is to hire interns as full-time employees. The conversion rate currently is higher now than in more than a decade at almost 62%.

A further article by Salticoff, (2017) affirmed the positive correlation between internships and employment. Referencing a study conducted by the Endicott College Research Center, 327 / 1680 surveys were completed by internship supervisors between 2011 and 2016. The results were definitive, stating that from the 2015 graduate pool, 98% were employed in various capacities, both full and part-time and 53% indicated that their current jobs had a direct connection to their internship or contacts obtained during their internship.

Mount Holyoke College in conjunction with the NACE Center for Career Development and Talent Acquisition (Townsley, Lierman, Watermill, and Rousseau, 2017) revealed that the number of internships combined with a students’ grade point average are the keys to positive early career outcomes either in securing an initial job post-graduation or entering a graduate program within 6 months. Compared to those who did not secure an internship, students who participated in 2 or more internships, were also twice as likely to find employment within 6 months of graduation.

Relevant work experience is also key for hiring managers. By analyzing resume audits, Nunley, Pugh, Romero, and Seals (2016) found that internships can improve a candidate’s ability to acquire an interview at a rate that is by 14% higher than those who did not choose an internship. “Door openers’ was the term used by Saniter and Siedler (2014) when referring to these potential placements. Again, this research confirms a positive relationship between some industry-related experience garnered from internships and the next step in career progression.

In a study by Cappelli, (2014), he asserts that there is little to no evidence of a skills gap, but rather there is a skills mismatch or even that candidates may be over-qualified with more education than the requirement for the position. Internships may even support the notion that any skills mismatch may be minimized with on-site, experiential internships.

DATA AND RESULTS

This study utilized Slippery Rock University (SRU) as a case example. SRU is a public university and a member of the Pennsylvania State System of Higher Education, which enrolls a diverse student body from primarily the tri-state areas and the state of Pennsylvania, with a total enrollment of approximately 8,900 students. SRU offers a full range of traditional academic programs including Bachelors, Master’s and doctoral degrees. In many ways, SRU reflects the institutional characteristics of a representative major public university in the country.

To collect data on student internship opportunities in the School of Business, a survey was designed to gather information on student internship sites, the way in which such internships were obtained by the students, whether these opportunities led to a job offer and the overall effectiveness of internship experiences. This survey was administered through the Career Education and Services office of the university. There were 88 responses / 230 to
the survey (44 percent response rate), who provided information regarding the internship experiences and how that aided in career connections. In terms of the student attributes, an average GPA of 3.23 is reported. About 43 percent of the respondents are female, and the average age is 27 years. Since the SAT scores for incoming freshmen fluctuate over time as the tests change, the average scores reported is consistent with today’s average which is slightly over 1000, around 1094.

Survey results indicated respondents’ year of graduation from SRU range from 2007 to 2019. The majority (over 15 percent) of the respondents are graduating in May 2019, over 10 percent graduated in 2014, about 8 percent in 2016 and 6 percent in 2007. Hence the data includes both recent graduates as well as past graduates, which gives us the opportunity to measure the impact of internships on the career outcomes for the students.

There were a variety of different sites where students did an internship before graduating from the school of business. Amongst the internship sites reported in the survey, the recurrent ones were Pittsburgh Pirates, Pittsburgh Steelers, The Volunteer Income Tax Assistance program (VITA) for lower-income tax preparation, and various YMCA locations. About 21 percent of the internship sites were higher education institutions. Others included manufacturing, insurance, banking, etc.

One of the challenges that students face in securing an internship is being able to utilize network opportunities that they develop during their time in school and work. Successful completion of internships is a predominant factor in future career success. The Career Education and Services office often works with faculty departments, and clubs and organizations to ensure students from freshmen to seniors are steadily working towards a rewarding and meaningful career. The career presentations and workshops include resume & cover letter development, successful interviewing strategies, LinkedIn & professional networking, social media & technology in the job search, job & internship searching, bills, budgets, & benefits and salary negotiations. These are useful resources for students seeking internship opportunities. The survey results indicate around 25 percent of respondents reported career office (Figure 1), faculty and advisors referring them to the internship openings. A majority 45 percent of respondents reported searching company websites and responding to advertisements posted as the primary means of obtaining internships.
Internships are important because of the career connections and networking opportunities that start with such openings. Frequently, with the conclusion of a successful internship, students are offered their first full-time jobs with the same organization. Figure 2 reports that almost a third of the students were offered a full-time position. Forty-two percent of the respondents were not offered a job at the end of the internship term. Amongst the primary reason for not having a job offer following an internship, was the unavailability of an open position. Some respondents indicated that they were offered a full-time position at the site after one or two years of completion of the internship. Others indicated that they were not looking for full-time employment after the internship since they were planning on attending graduate school. A few of the respondents had already secured a job offer, prior to doing the internship.
Out of the ones who were offered a job at the conclusion of the internship, a majority (67 percent) accepted the job offer. The benefits of an internship are evident in the increasing number of students who successfully completed the internship and were able to secure a full-time job after completion of the internship requirements. Within this group who accepted the position, most of them indicated in the survey response that they were very satisfied with their current salary and benefits package. The internship opportunity provided them with an option of applying their knowledge and skill set to a real-world marketplace, and further give them the career transition choice.

Amongst the students who decided not to accept the job offer after the internship, a variety of reasons were provided, the main were returning to graduate school in an MBA program. These students were aiming for a career advancement, and utilized the experience gained in the internship towards applications to graduate programs. Others indicated that they wanted to explore further opportunities in quest of higher salaries and better positions. In contrast, some students also decide that the field and/or site may not be the right fit for them, which is also valuable insight that is gained early in the process and relatively risk-free.

In analyzing the impact of internships on career advancements, the survey responses also indicated that for the vast majority of students, internships provided the applications-oriented experience that they required for a successful performance in a job. A majority of the respondents who did accept a job offer at the end of the internship did not continue with that organization after two years. 86 percent of these respondents made a career transition within two years of the initial job acceptance. This indicates the effectiveness of an internship opportunity for the students, whereby they gain the hands-on experience, and have the job offer, and are more prepared to make the career transition decisions in the future.

In response to the question on the effectiveness of the internship opportunity, a majority (40 percent) of survey responses confirmed that the real-world application and hands-on experience obtained from the internship to be the most important impact of the internship (Figure 3). A substantial number of respondents indicated that gaining experience working in the field was one of the most useful benefits from an internship. These experiences
enhance the application of the concepts taught in class, and aid in the career connection opportunities for students. Building strong networks was one of the other practical aspects of doing an internship. These networks have helped students secure jobs as well as switch jobs that offered better prospects and career progression. A significant number of respondents also indicated that the internship experience helped them realize that their choice of major and subsequent career choice was indeed the right option for them. By doing the internship, they had a much better idea about the skill requirements of the job, which helped them make the career choice. Finally, one of the other positive aspects of internship as noted by respondents were developing time management skills. Being in a real job scenario, students had the opportunity to get acquainted with how work life proceeds. Through an internship, the students were able to realize how to best manage time between their job and other responsibilities and were much better prepared for their work-life balance as they transitioned into their respective career paths. Respondents unanimously agreed on the essential and effective nature of the internship opportunities for them and recommended such an experience for every student to be successful in their future careers.

**Figure 3: Effectiveness of Internship Opportunities**

Future research could include investigating additional attributes and a longitudinal study of career progression after acceptance of the initial job offer. Also, as more information is captured in exit interviews and from alumni, this data could prove invaluable to higher education administrators to strengthen and expand internship programs, sites, placement, etc.
CONCLUSION

Most research confirms the validity of internships and the value that they bring to both the employer and the student. The mutually beneficial nature of these experiences was confirmed in this research. Although students and interns are not required to be paid by the Fair Labor Standards Act, many are, equating to another positive attribute of this form of on-the-job training. Internships are still learning tools and are not a guarantee of job success. They do, however, often position the intern as a top candidate for available full-time openings. In a world where educators are training students for jobs that don’t exist, skill development and experiential learning are paramount and afford students excellent opportunities for growth. Universities now have considerable evidence to expand and enhance their respective placements in organizational sites where partnerships can flourish.

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OBESITY AND SOCIOECONOMIC STATUS AMONG PERUVIAN WOMEN: EVIDENCE OF PANEL DATA ANALYSIS

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ABSTRACT

Rates of overweight and obesity have risen dramatically during the last 3 decades, representing a global pandemic. Rates of obesity have been leveling off in some highly industrialized societies, but rates of obesity remain high in the developing world. In Peru, obesity rates have been escalating and vary according to area of residence and socioeconomic position. In particular, the information available in the Demographic and Family Health Survey (ENDES) shows that during the years 2008 and 2017 the rate of obesity in women increased from 14.60 to 22.91 percent, despite the progress made in reducing the poverty and income inequality, during the reference period. There is growing evidence that obesity is largely an economic issue. In this paper, we will provide an overview and an economic analysis of obesity based with emphasis on the issue that obesity epidemic cannot be separated from stemming the tide of poverty and income inequality gap. We are using panel-data analysis using data from 2008-2017, 10 years, 24 regions, a sample size of 240 data. This study finds that there is a cointegration among obesity, poverty and income inequality which ensures a long-run relationship among the variables. In summary, in Peru, in addition to the social progress registered in terms of poverty and income inequality, it is necessary to focus on actions aimed at promoting a healthy diet, thereby minimizing the negative consequences of obesity in the future.

KEYWORDS: obesity, medical costs, economics, cointegration, inequality gap, poverty, food prices, panel data analysis.

1. INTRODUCTION

While some countries are suffering from food scarcity, at the same time, a significant number of them are having to deal with the opposite problem: excess weight and obesity. For the first time ever, there are more overweight people in the world than there are people suffering from malnutrition. In 2016, more than 1.9 billion adults, 18 years and older were overweight. Of these over 650 million were obese (The World Health Organization, 2018).

Obesity has become the worst nutritional threat in Latin America, which is adding overweight people at a rate of 3.6 million annually (United Nation Report, 2018). Hunger affects over 39 million Latin Americans, or just over 6 percent of the population. Between
2016 and 2017 the total increased by 400,000 people, twice as many as it did in the previous year (ibid).

Latin America is still the region with the highest rates of inequality in the world. This part of the American continent is home to scenarios of growth with poor income distribution, stagnation or poverty. A meta-analysis conducted by the World Health Organization (WHO) showed that 58.2% of adults over 18 years of age in Peru are overweight or obese; that is well over half of the population (cited in Fallon, 2015).

According to the National Institute of Statistics and Informatics and the World Bank, Peru is an upper-middle income country with an estimated population of 32 million people (in 2017). Per-capita Gross National Income (GNI) is $5,960 in 2017 (The World Bank, Peru, 2019) and 6.9 million (44 percent) live in poverty with about 21.7% of population are below the poverty line. On the other hand, the inequality of income measured by Gini Coefficient, decreased from 0.48 to 0.43, from 2008-2017 (Figure 1), this indicator still shows that Peru is a country with high inequality because the Gini coefficient is above 0.30, a threshold generally considered for countries with a relatively equitable distribution of income.

Over the past several decades, obesity has grown to be a major global epidemic. There are numerous factors contributing to obesity, among those are consumption of high-fat, carbohydrate-dense foods and physical inactivity, which could affect obesity rates and differences in rates by country, in both rich and poor subgroups (Monteiro, et al. 2004).

In addition, the relationship between obesity and socioeconomic status (SES) in both industrial and developing countries has been extensively investigated. In developed countries, obesity is widely considered a condition that affects people of lower socioeconomic status (SES) more so than those of higher SES. In developing countries, however, the debate continues as to whether obesity primarily affects the poor or the rich. The literature indicates that people with low socioeconomic levels in developed countries have higher rates of obesity, while in middle- and low-income countries the opposite phenomenon occurs (Poskitt, 2014). Hojjat & Hojjat (2017) confirmed that there is a long-run relationship exist among obesity, income inequality and poverty in the U.S. They found that the greater the income inequality and poverty, the higher the obesity rate is in the U.S. Salmasi and Celidoni (2017) study the effect of income and wealth-based poverty on the probability of being obese for the elderly in Europe. Their study shows that poverty significantly increase the probability of being obese for both men and women.

Unlike industrial countries, developing countries trend could be different. For example, Hou, X, et al (2008) study in urban China, found out that higher household income was associated with higher obesity risk, whereas women with higher education had a reduced risk of obesity. In addition, both higher education and income have been described to be associated with increased obesity rates in Bangladesh (Khan & Kraemer, 2009). In a nationally representative sample of Indian subjects, which included both rural and urban groups, obesity rates were higher in women who were wealthier, and greater as the level of urbanization increased (Subramanian & Smith, 2006). Monteiro et al (2001) found out that there are within country variation in the association between socioeconomic status (SES) and obesity the odds ratios for obesity were greater in individuals with higher incomes in disadvantaged region in Brazil (Subramanian & Smith, 2006). In addition, a study in Mexico examined the relationship in poor rural regions and found that higher SES was associated with higher odds of obesity (Fernald, 2007).
Low- and middle-income countries, such as those in Latin America, are undergoing a rapid epidemiological and nutritional transition. Typically, the factors responsible for this shift are urbanization, changes in dietary patterns and reduction of physical activity, resulting in increased rates of obesity (Prentice, 2006, Popkin, 2001, Uaury, et al, 2001). Upon moving to the urban core, people tend to shift away from an agrarian lifestyle, which consists of doing hard manual labor on a daily basis, to a more sedentary lifestyle. While caloric output radically decreases, caloric input remains high. Oftentimes, caloric intake is even higher in urban settings due to ample access to processed foods and fast food. In addition to urbanization and lifestyle changes, the food is seductive, inexpensive, and far too readily accessible. As a result, obesity rates in Peru have been escalating and vary according to area of residence and socioeconomic position. Study found out that obesity in Peruvian women has been linked to high levels of wealth, low levels of education, and urban contexts (Poterico, et al, 2012).

According to the World Health Organization (WHO), Peru had the highest fertility rate in the Latin American region in 2012. Some study found a positive and strong association between parity and obesity, mainly in young and rural women (Huayanay-Espinoza, et al, 2017). This study findings show that parity, especially in young rural women, is an independent key factor in increasing rates of obesity. This population is also characterized by low levels of access to prenatal care among women in urban areas and among older women. This fact was evidenced based on the point that the training programs of health professionals lack components linked to primary care (Jimenez, et al, 2015). Moreover, these training programs are outdated because of current epidemiological changes (ibid). Similarly, a systematic review showed that pregnant women, especially those at risk for obesity, gestational diabetes, or malnutrition, do not receive adequate nutritional education, especially because of lack of time, resources, and training of health care providers (Lucas, et al, 2014). Developing countries, and especially their most vulnerable areas, are characterized by women with high levels of malnutrition. By contrast, in Peru, which is currently undergoing a rapid epidemiological transition, obesity has almost tripled in women aged 20 to 49, especially in rural areas (Loret de Mola, et al, 2014).

Lowering obesity is quite critical for developing countries as it can contribute to higher economic growth and lower government costs. Research (Aghion, et al, 2010) conducted a cross-country regressions analysis over the period 1960-2000 to investigate the relationship between health and economic growth (measured by GDP per-capita) in light of modern endogenous growth theory. They found that a higher initial level and a higher rate of improvement in life expectancy both have a significantly positive impact on per capita GDP growth. The main reasons are individuals with higher life expectancy are likely to save more, and savings in turn feed back into capital accumulation and therefore into GDP growth. In addition, individuals with higher life expectancy are likely to invest more (or to have their parents invest more) in education, which in turn should be growth-enhancing. Finally, and more directly, healthier individuals are typically more productive, better at creating and adapting to new technologies and generally more able to cope with the rapid changes characteristic of a high growth environment (Howitt, 2005).

Obesity became a global concern and not limited to developing countries as most of the world has grown fatter since the 1970s. According to the most recent figures from the National Child Measurement Program, which assesses the height and weight of primary children in England, just over 33 percent of 11-year-olds are now overweight or obese and among four- and five-year-olds it is 22 percent. The figures are similar in Wales, Scotland,
and Northern Ireland (Winterman, 2013). As the median person becomes fatter, it becomes socially acceptable to be fat (Jenkins, 2013).

Causes and consequences of obesity are beyond the scope of this paper, as it can be very complex regarding heterogeneous population at the individual level. However, it is crucial to better understand potential risk factors associated with high rates of obesity. Thus, the present study aimed to assess the association between poverty, income inequality and obesity in order to help policy makers to design policies with the understanding of the contributing risk actors.

Therefore, we will analyze the issue from an economic point of view; considering the major factors contributing to obesity in general. The first part of this paper provides a brief introduction of the issue. Section 2 is review of literature, section 3 is the relationship of poverty, income inequality and obesity. Section 4 describes the model and methodology. Section 5 reveals the result and discussion of our findings. Section 6 gives an overview of food policy recommendations and intervention to fight against obesity and finally, section 7 concludes the paper.

**Obesity:** The terms “overweight” and “obesity” are used to express weight ranges that are greater than what is considered healthy for a given height. In the case of adults, weight and height are used to calculate “Body Mass Index” (BMI) to define what qualifies as overweight and obese. Standardized cutoff points for overweight and obesity: Normal weight is a BMI between 18.5 and 24.9; overweight is a BMI between 25.0 and 29.9; obesity is a BMI of 30.0 or higher. For more details, see Table 1 on weight range. In order to calculate BMI, take your weight in kilograms and divide it by your height in meter squared. If you are 5 feet 6 inches and 150 pounds, your BMI is 24.2.

In Peru total spending is approximately 893 million dollars a year on weight-related diseases (Perú 21, 2017) such as; type II diabetes, heart disease, hypertension, high cholesterol, gallbladder disease, and osteoarthritis as merely on the top of the list. For example, 17.6% percent of obese adults have arterial hypertension (INEI, 2017), which is the main cause of death in adults (Andina, 2012). Authorities view obesity as one of the most serious public health problems of the 21st century (Barness, et al, 2007).

Peru is at a relatively early stage of the nutrition transition, with obesity rates for Peruvian woman showing an increase from 9% in 1991 to 11% in 2005 (Mispireta, et al, 2007). However, during the period 2008-2017, this rate has continued to increase markedly. For example, in 2008, the rate of obesity in women was 15%, it increased by 4% by 2011. At the end of 2017, the obesity rate increased to 23%, which is equivalent to a 53% increase since 2008. The prevalence of chronic non-communicable diseases, based on self-report surveys considering hypertension, diabetes, asthma and other conditions together, has increased from 20.5% in 2005 to 25.4% in 2009 (INEI, 2008). In 2012, obesity caused 22.77% of deaths due to cardiovascular diseases (La República, 2012), affected more than 28% of Peruvians in 2014 (El Comercio, 2014).

At present, obesity is not only a problem from the clinical point of view; it is also a social issue of considerable importance. In addition to physical ailments, obesity has been found to be related to lower satisfaction with work, family relations, partner relationships, social activities, and depression (Stutzer, 2007). Obesity increases the likelihood of various diseases, particularly coronary heart disease, type 2 diabetes, certain cancers (endometrial, breast, and colon), hypertension (high blood pressure), dyslipidemia (for example, high total cholesterol or high levels of triglycerides), stroke, liver and gallbladder disease, obstructive sleep apnea and respiratory problems, osteoarthritis (a degeneration of cartilage and its
underlying bone within a joint), and gynecological problems (abnormal menses, infertility (CDC.gov). At all ages, obesity is associated with social isolation, depression and other major mental health problems.

REVIEW OF LITERATURE

There has been an increase in the prevalence of obesity amongst both genders of all ages and ethnic and racial backgrounds. There are numerous factors contributing to obesity as presented in Figure 2. Energy-dense foods and energy-dense diets have been blamed for the global obesity epidemic (French, Story, Jeffery, 2001). Energy density of food is defined as the energy per unit weight or volume (kcal/100g or megajoules per kilogram). The frequency of consuming restaurant food was positively associated with increased body fatness in adults. Several studies investigated the reason for obesity including proportion of household food income spent on food prepared away from (McCrory, et al. 1999), snacks, sweets, and desserts (Zizza, et al., 2001), sweetened soft drinks (Bray, Nielsen, Popkin, 2004) and large portions sizes (Rolls, et al., 2002) have all been linked to greater obesity risk.

Several authors have offered explanations for the increase in adolescent obesity in Latin America. Martorell and co-authors (1998) have noted that the traditional diet of the region has undergone extensive modification such that it now resembles the high-fat, high-calorie diets consumed in industrialized societies. These authors speculate that consumption of high-calorie diets and a more sedentary lifestyle have resulted in an increase in the incidence of obesity and of obesity-related degenerative disorders in the region. Troiano and Flegal (1998) have observed that the increases in obesity worldwide are due to social and environmental factors including changes in parental employment patterns, increased television viewing, concerns about neighborhood safety, and the increased availability of video games. Findings from the present study suggest that another contributing factor to the increase in adolescent obesity in Latin America is a deficit in obesity knowledge in this age group.

In addition, food choices are made on the basis of taste, cost, convenience, and, to a lesser extent, health and variety (Glanz, et al., 1998). Variety refers to the innate drive to secure a varied diet, whereas health refers to concerns with nutrition, chronic disease, and body weight. The authors used a national sample of 2,967 adults. Response rates were 71 percent to the first survey and 77 percent to the second survey (which was sent to people who completed the first survey). Univariate analyses were used to describe importance ratings. Respondents reported that taste is the most important influence on their food choices, followed by cost. Their results suggest that nutritional concerns are less relevance to most people than taste and cost. One implication is that nutrition education programs should attempt to design to promote nutritious diets as being tasty and inexpensive.

The basic idea related to the obesity infrastructure is that “the root of the [obesity] problem lies in the powerful social and cultural forces that promote an energy-rich diet and a sedentary lifestyle” (Brownell and Horgen, 2004). This environment has intensified over the past thirty years by opening more fast food restaurants and more advertising. The authors explore the economics of food and make it clear that the profit motive of the food industry is not consistent with the current nutritional needs of the nation. Health economists have demonstrated that the prevalence of obesity is directly proportional to food prices and access to restaurants (Chou, et al, 2004). They estimated the effects of fast-food restaurants advertising on children and adolescent being overweight. Their results indicate that a ban on theses advertisements would reduce the number of overweight children ages of 3-11 in a
fixed population by 18 percent and would reduce the number of overweight adolescents’ ages of 12-18 by 14 percent (Chou, et al., 2008). Another study reveals causes range from a lack of education about food, limited cooking skills, and limited money to buy healthier food to longer working hours and marketing campaigns for junk food aimed at kids (Winterman, 2012).

Although the dramatic rise in obesity can only be explained by environmental factors, there has been little emphasis on the obese persons’ economic environment. In particular there has been little research on diet quality and economics of food choice. The broader problem may lie with poverty, growing disparities in incomes and wealth, declining value of the minimum wage, food imports, tariffs, and trade. Rising obesity rates reflect an increasing unequal distribution of income and wealth. It is by now widely accepted that income poverty is a risk factor for premature mortality and increased morbidity (Subramanian and Kawachi, 2004). There is in fact intriguing evidence that a person’s socioeconomic position can affect health. Braveman (2014) insists that illness is caused by the power imbalance in the capitalist society. He emphasizes on the concepts of health disparities and health equity, and explains the rationale based on principles from the fields of ethics and human rights. We must counteract the free market with social programs.

According to Fineberg, former dean of the Harvard School of Public Health, “a school of public health is like a school of justice.” Income inequality affects health by undermining civil society. Lack of social cohesion leads to lower participation in political activity (such as voting, serving in local government, volunteering for political campaign). And lower participation, in turn, reduces government spending on public goods, such as education, and social safety nets (Satel and Marmor, 2001). It is not just income dispersion itself that matters for health but the proportion of the population that suffers true poverty-related problems, such as under-nourishment, lack of access to timely medical care, and lack of access to healthy food and so on.

Choice of certain products and eating habits are closely related to preferences, lifestyle, culture, ethnicity, and income level. Since World War II, food tradition and culture of the industrialized countries have suffered a sudden and profound change: of course, economic development has led to greater availability and variety of food, but such availability resulted into greater obesity and diseases associated with it (Neel, 1962). In developing countries the food culture is changing, they tend to adopt eating habits similar to those of the western world, and they are particularly influenced by the industrialized American diet and availability of information and access to packaged food. In 1989, Sobel and Stunkard (1989) published a seminal review of literature on the relation between socioeconomic status (SES) and obesity, they covered the 1960s through the mid-1980s and found 144 published studies on the SES-obesity relation in men, women, and children in the developed and developing world. They found a consistently inverse association for women in developed societies with a higher likelihood of obesity among women in lower socioeconomic status. In developing societies, a strong direct relation was observed for women, men, and children, with a higher likelihood of obesity among persons in higher socioeconomic strata.

POVERTY, INEQUALITY AND OBESITY

Poverty status or percentage of poverty level is based on family income, family size, and the number of children in the family, and for families with two or fewer adults, on the age of
the adults in the family. The poverty level is based on a set of income thresholds that vary by family size and composition. Families or individuals with income below their appropriate thresholds are classified as below the poverty level. In Peru, the official poverty definition supported by the National Institute of Statistics and Informatics (INEI, 2000) uses the poverty line method for consumption, the value of all the goods and services consumed by the household is incorporated, regardless of the form of acquisition or attainment. The use of consumer spending has the advantage that it is the best indicator to measure well-being, because it refers to what a household consumes and not what it can potentially consume when measured by income. Another favorable aspect is that consumption is one more variable stable income, which allows a better measurement of the poverty level trend.

In the estimates of consumption expenditure made by the National Institute of Statistics and Informatics (INEI), all sources of expenditure are considered, monetary expenditure, as well as the various forms of acquisition of goods and services that do not imply a monetary payment of part. This last group includes self-consumption and self-supply, as well as in-kind payments that come from households' own economic activities and also the elements of expenditure received by transfers from other households or by part of public and private organizations. Likewise, within the components of expenditure, expenses in health and public education are excluded, due to the lack of adequate prices to value said services consumed by households. Finally, the imputation for the consumption of river water or ditch is also excluded, because the degree of transformation of said goods is almost nil and there is no commercial value that allows an adequate valuation (INEI, 2018, p.165).

Peru has historically been one of the poorest and most unequal countries in Latin America. Sustained economic growth has reduced poverty by over half and extreme poverty by three fourths in the last ten years. However, poverty is still widespread among indigenous communities of the Andean highlands and Amazon jungle (Peru Reports, 2018). Peru’s middle class is slightly smaller today than it was in 2011 according to a study by Lima’s Chamber of Commerce. The seven Peruvian regions, which registered smaller middle classes include Huancavelica, Pasco, Amazonas, Piura, Ucayali, Cajamarca and Madre de Dios. On the other hand, four regions which saw slight increases in the size of their middle class included Ayacucho, Tumbes, San Martin and Junin. According to the Peru Report 2015, of the 9.1 million Peruvians who belong to the middle class according to IDEPE’s definition, over half live in Lima and Callao, and 20% live in Arequipa, La Libertad, Piura and Cusco. Obesity is an increasing public health concern in several developing countries, including Peru. An analysis of Demographic and Health Survey (DHS) 1996 showed 9.4% prevalence of obesity in Peruvian women. Data from the DHS 2008 showed a 14.3% prevalence of obesity, which is an increase by 52% in obesity rates in Peruvian women (Poterico, et al, 2012).

McArthur, et al (2001) examined the effects of socioeconomic status (SES) on the obesity knowledge of adolescents in six Latin American cities. They found out that the weakest knowledge areas among youth from the higher SES groups were food preparation methods and the relationship between obesity and health while those for adolescents from the lower SES groups were the fat and calorie content of foods and beverages and the relationship between obesity and health. Classroom instruction about obesity was generally more available to students from the higher SES groups. The majority of adolescents from both SES groups were interested in learning more about weight loss methods, energy
expenditure, and the fat and calorie content of foods and beverages. The topic of least interest was the relationship between obesity and health.

As the Economist magazine notes in its own survey of obesity, “the rich and well-educated have mostly managed to stay slim.” The relationship between obesity and poverty has become more obvious and complex: being poor in one of the poorest countries may be associated with poor nutrition, while being poor in a developed country could mean a higher risk of obesity. This is confirmed by Sobal and Stunkard (1989): in developed countries, there is an inverse relationship between obesity and socioeconomic status, the higher social classes are able to compensate for a sedentary lifestyle, with more information and sport opportunities, plus they can afford better quality food, organic and less processed. In less developed countries, with a $2,500 GDP per capita, a direct relationship prevails and, excess weight is observed more frequently among the higher social classes (Monteiro et al., 2004).

Existing studies suggest that the high cost of healthier diets may contribute to the obesity epidemic especially among the lower-income group and low-educated group (Table 2). At the individual level, obesity rates are linked to low incomes, low levels of education, minority status, and a higher incidence of poverty. Tomer (2011) in his research indicates that socioeconomic groups with low personal capital, low health capital, and low social capital have higher obesity rates than socioeconomic groups with higher endowments of intangible capital. This has been supported by other studies that indicates that higher diet quality, as measured by the Healthy Eating Index, is associated with higher incomes, more education, and with lower rates of obesity and overweight (Henderson, 2007).

According to the following information presented overweight/obesity rates in Table 2, during 2008-2017 the percentage of obese individuals has been the higher for higher wealth quintile. In 2008, the obesity for higher quintile was 16.2% and for low-income family was 4% whereas in 2017 these percentages were of 16.8% and 21.3% respectively. This data indicates that obesity rate has increased for both upper and income quintile, but it has increased much higher for the lower quintile. This view point is not consistent with Lakdawall and Philipson (2002) findings stating that the obesity problem and poor health status is very much a problem of low-income status. So then, other studies highlight the role that has been played by such determinants as agricultural modernization, technological innovation in food production, the economic crisis, globalization and the liberalization of trade (Torres, 2012). With regard to the latter factor, it has been noted that the existence of economies that import products such as high-calorie industrialized foods with a significant sugar and fat content and which are low in unrefined carbohydrates, has produced changes in eating patterns, resulting in an increase in excess weight and obesity in broad sectors of the population. At the same time, observers have warned that income reduction has led many families to adopt new spending strategies which are also, to a great extent, a result of imitating external patterns and of persuasive action exerted by food companies via advertising.

Although other factors, including addictive personality, stress, and depression, seeking comfort in familiar foods has been among factors leading to higher consumption of sweets and deserts. In addition, physical access to supermarkets and grocery stores, marketing and distribution of healthy foods, urban sprawl, and the time spent commuting to work have also contributed to failure to adhere to healthy diets (Morland, Wing, Diez, Poole, 2002). This implies that people with weak and/or negative social capital are more likely to be vulnerable.
to the influences from the infrastructure of obesity and the economic incentives from the markets regarding food and exercise.

Table 2 shows the main characteristics of obese women in Peru, conducted between 2008 and 2017. In this regard, it is appreciated that obesity was the main priority of such study and they measured obesity/overweight in the 24 regions in Peru. On the other hand, the natural region with the highest level of obesity of 26.3% is the Rest Coast. According to the educational level, the main percentage of obese women is found in the basic levels of education (primary, 27.7% and secondary, 23.4%) and even in those women who do not have any educational level, 29.5%. Finally, it is observed that according to the income quintile, the fourth quintile concentrates the highest proportion of obese women, 27.5% in 2017. However, as the income quintiles increase, it is also observed that women's obesity levels increase. In general, the indicators of obesity are relatively alarming since between 2008 and 2017, the obesity rate has almost doubled, increased from 14.6% in 2008 to 22.9% in 2017, which is why this topic deserves serious public policy concern.

Tomer (2008) argues that in the presence of strong positive social relationships, people’s imbalances are likely to be more muted and less problematic. Conversely, when social capital (SC) is weak and negative, people’s imbalances are likely to be more pronounced and problematic. Social capital refers to the capacity that is embodied in an individual’s social relationships or the bonds and connections between an individual and others. Social capital is embodied in families, institutions, civic communities, and the larger society. The strength and quality of an individual’s SC endowment arguably has a relationship to the person’s likelihood of becoming obese (Tomer, 2011).

Model to Test Income Inequality, Poverty and Obesity in Peru

Poverty and obesity varies among regions, as indicated in Table 3 & 4, where the Madre de Dios region has the highest obesity rate of 35.03% in 2017 and Huancavelica has the lowest rate of 12%. Appendix in tables A3 shows the data on obesity for 2008-2017 for all regions.

The Measurement of Income Inequality and If Inequality Makes You Sick

Various measures are available to quantify the extent of income inequality within a given community or society. Of these, the Gini coefficient is the one frequently used. Gini coefficient varies from 0-1.0 and it is defined as half of the arithmetic average of the absolute differences between all pairs of incomes in a population, the total then being normalized on mean income. If incomes in a population are distributed completely equally, the Gini value is 0, and if one person has all the income (the condition of maximum inequality), the Gini is 1.0.

It is widely acknowledged that individual income is a powerful determinant of individual health (Subramanian and Kawachi (2004). Bezruchka (2001) has made the startling claim that income inequality is the major cause of our nation's health problems. He dismisses the role individuals can play in safeguarding their own well-being, claiming that "research during the last decade has shown that the health of a group is not affected substantially by individual behaviors such as smoking, diet and exercise." Better prescriptions for a healthy society, he argues, would include a "consumption tax."

Bezruchka is not alone in believing that improving health depends upon transforming economic conditions. Kawachi (2000) in his book “Is Inequality Bad for Our Health?” declares income inequality an “important public health problem.” Indeed, for the past decade
public health experts have become increasingly eager to expand their professional agenda beyond health into broader controversies. To be sure, attempts to understand the ultimate non-medical sources of ill health (e.g., education, class, deprivation) have occupied scholars for decades.

None of this is to deny that social conditions, especially poverty, affect physical well-being and length of life. And public health practitioners do have a responsibility to design policies that reliably prevent disease, reduce contagion, and minimize injury. But it is overestimation in thinking they have special expertise in changing the income distribution, in defining social justice, or in producing the instruments that can attain it.

The hypothesis reached a wide audience in the early 1990s through the publications of Wilkinson (1996) who claims the causal link between income inequality and individual health represents the most important limitation on the quality of life in modern societies. From this he concludes there is "a persuasive case for the redistribution of income". Wilkinson and others point to data purporting to show that health and longevity are, in large part, determined by relative wealth. For example, wealthy countries with more equal income distributions, such as Sweden and Japan, have longer life expectancies than the United States.

Kawachi, et al (1996-2000) expand on Wilkinson's thesis. "The health of a population depends not just on the size of the economic pie, but how the pie is shared". The authors speculate on how social inequality produces differences in health at each step on the socioeconomic ladder. "Income inequality," they observe, "appears to affect health by undermining civil society. Lack of social cohesion leads to lower participation in political activity (such as voting, serving in local government, volunteering for political campaigns)." And lower participation, in turn, reduces government spending on public goods, such as education, and social safety nets.

Other public health scholars point to the disease-producing anxiety of not being able to keep up with the Joneses. As Lynch and Kaplan (1997) argues that health may be affected through individual appraisals of relative position in social order. Even those with good incomes might feel relatively deprived compared to the superrich. There is in fact intriguing evidence that a person's socioeconomic position can affect health. Thus, it is not so much income dispersion itself that matters for health but the proportion of the population that suffers true poverty-related problems, such as under-nourishment, lack of access to timely medical care, and so on. Pollack points out, the health impact of inequality itself is really unknown, once one controls for closely connected characteristics like race. What we are left with is energetic advocacy of a deeply uncertain claim about the connection between health and the degree of income inequality (Satel and Marmor, 2001).

There are also dangers in concluding from the relationship between health and wealth that being less well-off produces disease. Indeed, the so-called healthy worker effect suggests an opposite reading: that health may determine income. After all, people who are healthier are more likely to hold jobs and to work competitively, activities that help them advance both their social and economic positions and, in turn, protect their health. We have to be cautious in generalization about generalizations about the longevity-threatening effect of a socially stratified society as there are some striking exceptions to the income-inequality schema. For instance, in Denmark, the gap between the top and bottom of the income scale is smaller than in the United States, yet its citizens have a lower average life expectancy than ours. The Japanese have the longest life expectancies, but their social hierarchy is very rigid.

The relationship between obesity and socioeconomic status differs by sex and race and ethnicity group. Among women and specifically non-Hispanic white women, obesity
prevalence increases as income decreases, while among non-Hispanic black and Mexican-American men obesity prevalence decreases as income decreases. Although the prevalence of obesity among women with income below 130 percent of the poverty level is higher than among those with higher incomes, most obese women do not have incomes below 130 percent of the poverty level. Among men and women with a college degree, the prevalence of obesity is lower than among those with some college education. Moreover, college educated women are less likely to be obese compared with those with less than a high school diploma. Between 1988–1994 and 2005–2008 the prevalence of obesity increased in adults at all levels of income and education (Ogden, et al, 2010).

MODEL AND METHODOLOGY

Specification of the model

In this study, we are going to follow Subramanian and Kawachi (2004) model of intrinsically multilevel nature of the income inequality hypothesis by contrasting the individual-level and aggregate-level models. Using typical regression notations, we can specify the individual-level relation between income and health as follows:

\[ y_i = \beta^*(x_i) + e_i, \]  

(1)

where \( y_i \) is the health status of individual \( i \); \( x_i \) is the income of individual \( i \); \( \beta^* \) represents the nonlinear (or concave) nature of the relation between \( y_i \) and \( x_i \); and \( e_i \) is the residual differences in individual health, after accounting for individual income. Meanwhile, the aggregate (societal) level relation between income inequality and health can be expressed in the following way:

\[ y_j = \alpha(W_j) + u_j, \]  

(2)

where \( y_j \) is the average health of a society \( j \); \( W_j \) is the income inequality in society \( j \) (measured by Gini-coefficient); \( \alpha \) estimates the relation between \( y_j \) and \( W_j \); and \( u_j \) is the residual differences in societal health, after accounting for societal level income inequality. Following the above independent and identical distribution assumptions, one can summarize these societal differences in a variance parameter. Following Subramanian and Kawachi (2004), we can summarize the following equation by incorporating the “income inequality hypothesis”

\[ y_{jt} = \beta^*(x_{jt}) + \alpha(W_{jt}) + u_j + e_{jt}, \]  

(3)

where \( y_{jt} \) is the health status of society \( j \) at time \( t \), \( x_{jt} \) is the income of society \( j \) at time \( t \) (with \( \beta^* \) estimating the nonlinear (or concave) nature of the relation between \( y_{jt} \) and \( x_{jt} \) within a society) and \( W_{jt} \) is the level of income inequality in society \( j \) (with \( \alpha \) estimating the effect of societal income inequality on individual health: Obesity having taken account of the individual income-health relation. An important aspect of the specification in equation 3 is that variation in health status is seen to be coming from two sources, that is, individual (\( e_{jt} \)) and society (\( u_j \)), and the variation attributable to the level of individuals and to the level of societies is appropriately partitioned.

Although Subramanian and Kawachi (2004) estimated their model using multi-level model, in this study we try to capture the differences in obesity state that arise from poverty and income inequality. We will try to establishing whether there is a cointegration among obesity, income inequality and poverty. The basic idea of this estimation is to check the monotonicity of the relationship which is crucial for policy purposes. Our hypothesis states
that both the poverty and income inequality positively affects the obesity. If the relationship is monotonic, then reducing income inequality or poverty will reduce the obesity.

In this study we define $y_{jt}$ as obesity which is used as a proxy for health status for each state $j$ at time $t$; $x_{jt}$ as poverty which is used as a proxy for poverty status of each state $j$ at time $t$; $W_{jt}$ as the level of income inequality in each state $j$ at time $t$. The sources and definition of variables are given in the appendix.

Based on the above information, we have the following econometric specification for panel data as

$$obesity_{jt} = \alpha_i + \beta_{1j}poverty_{jt} + \beta_{2j}gini_{jt} + \varepsilon_{jt}$$

(4)

or, in trans-log form, we have

$$ln_obesity_{jt} = \alpha_i + \beta_{1j}ln_poverty_{jt} + \beta_{2j}ln_gini_{jt} + \varepsilon_{jt}$$

(5)

where, each variable is expressed in natural logarithmic form and $j$ (refer to state) = 1, 2, ..., $n$; $t$ (refer to year) = 1, 2, ..., $T$.

It is important to specify that, for purposes of analysis, both the endogenous and explanatory variables of the model (5) are expressed in logarithms, for two main reasons: First, that the interpretation of the coefficients is much clearer and more direct, in the sense that, they represent elasticities, that is, they indicate in what percentage they respond to obesity in the face of a percentage variation in the poverty rate and income inequality. And second, that the variables are expressed on a similar scale, highlighting the linear relationship between them.

Also, according to the information available in the Institute of Statistics and Informatics (INEI), corresponding information was used for women of twenty-four regions of Peru between an age range of 15-49 years. Specifically, the information corresponding to obesity was obtained from the Demographic and Family Health Survey (EDES) and the information corresponding to poverty and income inequality was obtained from the National Survey of Households on Living Conditions and Poverty (ENAHO).

Methodology

There are a number of cointegration tests, such as Engle and Granger (1987), Johansen (1991) and Philips and Ouliaris (1990), which are documented in the time series literature. However, these tests fail to take advantage of information across countries, which lead to loss of efficiency in estimation. Pedroni (1999) devoted his efforts to develop cointegration tests with panel data. In this research, we have chosen the cointegration tests proposed by Pedroni (1999) to test whether the cointegration relationship exists in the estimated equations. Before estimating the cointegrating equation we perform unit root test of the variables according to Levine et al. (2002), Im et al (2003) and Breitung (1999). After the unit root test, we estimate the cointegrating equation (5) to determine whether $ln_obese$, $ln_gini$ and $ln_poverty$ are cointegrated.

RESULT DISCUSSION

Cointegration Analysis

The obesity equation (5) is estimated for a sample of 24 regions in Peru using annual data taken from of the Institute of Statistics and Informatics (INEI), specifically, that corresponding to the Demographic and Family Health Survey (ENDES) and to the National Survey of Households on Living Conditions and Poverty (ENAHO), Peru from 2008 to 2017. All variables are in logarithmic form. The first step is to check for the integration properties of the variables involved. The purpose of unit root test is to verify whether the data series
(time series) is non-stationary when running autoregressive modeling. The rationale for testing data for non-stationarity is to be sure that there is no effect from shock that would throw the series out of its long-term equilibrium.

Table 5 shows the results of the panel unit root tests. For the variables in levels, the specification used for each of the tests was individual intercept and trend, considering the presence of both components in each of the study variables. On the other hand, for the analysis of unitary roots, the specification with intercept was considered since, when differentiating the series, the trend component is eliminated.

More or less, a unit root is detected for the level variables, while the first differences appear to be stationary. Table 6 shows the results of unit root test for the variables in their first-differenced form. As a consequence of the fact that, when differentiating the series, the trend component is eliminated, the unit root tests of the reference table show that the non-stationarity hypothesis is rejected at a highly significant level (1%). The panel cointegration tests point to the existence of a long-run relationship between obesity and income inequality and poverty as presented in Table 7.

For example, the null of no cointegration is rejected by two of the Pedroni (1999) tests at 1% level. Specifically, when we consider intercept and trend case, both the panel statistics and group statistics reject the null of no cointegration in two tests. In general, cointegration is understood as the process through which non-stationary variables generate a residual stationary. Thus, for the case study it was possible to verify that the variables under study are not stationary in level, but in first difference, therefore, after the confirmation of long-run relationship, the next step is to estimate the long-run relationship. Table 8 shows the cointegrating regression using FMOLS method.

Poverty is highly significant, and income inequality is statistically significant at 10%. However, the sign associated with both explanatory variables is contrary to expectations. In particular, the sign obtained is negative, this result being not according to what is established by Sobal and Stunkard (1989), Monteiro et al. (2004), Tomer (2011) and Henderson (2007).

Although Peru is a developing country, the estimators obtained in the model do not reveal correspondence with what Drewnowski (2012) states: "Diets of lower income households provide cheap, concentrated energy from fat, sugar, cereals, potatoes and meat products - but offer little in the way of whole grains, vegetables and fruit. Low-income consumers are more likely to live in areas with limited access to healthier foods and to be users of fast - food as opposed to full - service restaurants".

On the contrary, the results obtained show that as the socioeconomic status of women has improved, the problem of obesity has worsened. This would represent a serious concern since the economic results are not reflected in better health conditions as reported by Sobal and Stunkard (1989). Being then the results obtained according to Bishwajit (2017) that reports a gradual rise in the prevalence of overweight and obesity in Bangladesh and Nepal. Likewise, the author demonstrates that women living in household with higher wealth status are significantly more likely to be overweight and obese compared to those living in poorer households, a finding that is consistent with that reported in this research.

This in turn is reflected in Table 2, where it is reported that the richest households (fourth and higher quintile) have higher rates of obesity in women in comparison to the lowest quintiles (21.3% vs 16.3% in 2017). Thus, the estimated model for the purposes of the present investigation is not only consistent with the findings reported by the author of reference, but also with the behavior of the statistical data of Peru. In particular, Graph A1 and Graph A2, make it possible to verify that the data on obesity, poverty and income inequality reflect the
results obtained in the long-term relationship. Graph A1 allows to verify that the less poor regions have higher rates of obesity while the poorest regions have lower obesity rates. Likewise, Graph A2 reveals that more equal regions have higher rates of obesity while more unequal regions have lower obesity rates.

This result also corresponds to the negative and statistically significant correlations presented in Table A-2 (Appendix) since poverty, the variable with the highest correlation (77.48%) has the highest elasticity with respect to income inequality whose correlation is 53.69%. In particular, the obesity-poverty elasticity indicates that for every 1% reduction in the poverty rate the obesity rate increases by 0.46%, while for the case of the obesity-income inequality elasticity, it is observed that for each 1% reduction in the Gini inequality coefficient, the obesity rate increases by 0.25%. Thus, it is observed that the elasticity of obesity-poverty is 1.84 times the elasticity obesity-inequality of income.

In summary, our results suggest that poverty is more responsible for the obesity than income inequality as the elasticity of obesity with respect to poverty is greater than that of with respect to income inequality. A final point to note from the long-term model is that the estimated residuals satisfy the condition of stationarity in level. Therefore, we can conclude that there is a long-term inverse and stable equilibrium relationship between obesity, poverty and inequality.

Causality Test

Although regression results show a basic type of correlation, they do not express the causality if there exists. To identify the causality among the variables, we conduct the panel Granger causality test suggested by Dumitrescu and Hurlin (2012). Table 10 shows the causality test result. It has been cleared that there is a unidirectional causal relationship between l_poverty and l_obesity at a level of significance of 1%. In that sense, poverty is an important reason for getting obese. Additionally, we find that l_obesity cause l_gini unidirectionally at a level of significance of 10%.

Obese adults are malnourished which affect their productivity and income in contrast to those who are not. This eventually reduces their income. And this in turn influences the distribution of income. For the case between l_poverty and l_gini the existence of a causal relationship to the Granger is not found.

Thus, once again the results obtained confirm that for the case of women in Peru between 15-49 years, the reduction of poverty is the main cause of the increase in obesity. In summary, the improvement of the socioeconomic status of Peruvian women has led to a deterioration of obesity.

FOOD POLICY INTERVENTIONS

Without effective intervention, the costs of obesity might well become catastrophic, arising not only from escalating medical expenses but also from diminished worker productivity, caused by physical and psychological disabilities. Future economic losses could mean the difference between solvency and budget imbalances for the Ministry of Health (MINSA), Comprehensive Health Insurance (SIS) and Social Health Insurance (Essalud); between expanding and shrinking health care coverage, and between investment in and neglect of our social infrastructure, with profound implications for our international competitiveness. The human costs would be incalculable (Ludwig, 2007).

Although broad consensus exists regarding the dietary and lifestyle habits needed to prevent and treat childhood obesity, we lack anything resembling a comprehensive strategy.
for encouraging children to eat a healthful diet and engage in physical activity. Such a strategy would include legislation that regulates junk-food advertising, provides adequate funding for decent lunches and regular physical activities at school restructuring in the farm-subsidies program to favor nutrient-dense rather than calorie-dense produce, and mandates insurance coverage for preventing and treating pediatric obesity (Ludwig, 2007).

Food policy interventions at the national and international level may be the most promising approach to making healthy food affordable and accessible to all. The World Health Organization (WHO) stated that the key to maintaining a healthy weight is an affordable supply of fresh nutrient-rich foods. Such access could be facilitated through a combination of agricultural subsides, pricing policies, regulatory action, and consumer education. This approach would require cooperation between government, academia, and the food industry.

There are two main policy approaches to address obesity. One approach is to reduce the demand for unhealthy products and to change the lifestyle that contributes to obesity. This approach can be achieved by information, education, taxing products, food labeling and reducing poverty. The second approach is to reduce the supply of unhealthy products by cutting subsidies of agricultural products that keep the costs low and increase consumption of unhealthy products. Ludwig (2007), suggesting there is a need for public policy changes, speaks to the importance of both education and regulation. “It suggests that if we want long-term changes in body weight, we will need to make long-term permanent changes in the environment for children”. Education matters, but it is not enough, it must be accompanied by restrictions that curb unhealthy habits and with environmental changes that foster healthier ones.

There have been several suggestions to not only remove the offending foods from the consumers’ reach, but also to discourage consumption and promote alternative healthier diets. This can be achieved through imposing taxes on fats and sweets and at schools by limiting access to vending machines containing beverages and snacks and regulating the sales of competitive foods. Agricultural policy options include the provision of economic incentives for the production of healthier foods and removal of existing subsides.

A basic consequence of economic law is that when something is subsidized, more of it will be produced while calories from high-fructose corn syrup are unhealthier than those from natural sweeteners, such as sugar. Children spend a significant portion of time in schools making it natural that the eating habits acquired during school years become lifelong.

Menu labeling provides nutritional information regarding calories, carbohydrates, and fat and sodium content. Currently, restaurants that have this information mostly present it on posters or websites but do not make it readily accessible to consumers when they are making food decisions.

Consumers are mostly ignorant of the food calories, content of sodium, sugar or fat in the food they eat. People who eat outside of their homes are more likely to consume supersized portions and it has been estimated that adults who eat outside consume 250 more calories per day. Portions served in fast foods and restaurant chains have been increasing since 1970s. Adults often read food labels and make purchasing decisions based on it.

**Taxation, Subsidization and reducing income inequality**

A tax placed on a product leads to an increase in its ultimate price. Price increases lead to a reduction in the quantity consumed. This occurs as consumers either cut down or stop purchasing the product. Taxes on items such as alcohol and tobacco in the U.S. have been
shown to reduce their consumption. One way to reduce the demand of unhealthy food is to impose tax on items that are most closely associated with obesity. Taxation alone is unlikely to address the problem; however, it does have several benefits. The revenue gained from taxation can be directed towards consumer education, providing exercise facilities and therefore lowering the public costs of health care. Another option is to impose taxes on restaurant franchises, which will ultimately reduce the supply of restaurants. Similar taxes can be imposed on snack vending machine and restaurants. Poor diet by specific populations can be targeted by taxing products in particular locations.

There have been studies to investigate the potential for soft drink taxes to combat rising levels of child and adolescent obesity through a reduction in consumption. Fletcher, et al (2010) results, based on state soft drink sales and excise tax information between 1989 and 2006 and the National Health Examination and Nutrition Survey, suggest that soft drink taxation, as currently practiced in the United States, leads to a moderate reduction in soft drink consumption by children and adolescents. However, they showed that this reduction in soda consumption is completely offset by increases in consumption of other high-calorie drinks. Proponents of soda taxation argue that it falls into the realm of a “pigovian tax.” Such a tax may actually increase total economic efficiency in the presence of externalities from consumption. Therefore, taxing such a good not only increases revenue for the government, but may also improve overall welfare by reducing “overconsumption” of the good. In the case of the soda tax, reducing consumption may reduce average body weight and obesity rates (McGranahan and Schanenbach, 2011). This, in turn, might reduce health problems related to obesity, such as diabetes and heart disease, and could reduce health care expenditures. It usually does not matter whether a tax is imposed on the producers or consumers of a good, because the producers can pass some of the tax on to the consumers, how much of that tax passes on to the consumers depends on elasticity of demand and supply for the product.

Research by the University of Illinois’s, Powell & Chaloupka (2012) and his colleagues found that existing state taxes on sugary drinks in the U.S. have not reduced soda consumption or obesity significantly. But those taxes are relatively small and a heavier tax would probably have some impact. Still, he said people have many other sugar sources apart from sodas – which makes a soda tax different from, say, a tobacco or alcohol tax. Thus, the effectiveness of imposing tax of sugar sources depends on how it affects the price of the products and hence consumptions.

Finally, leveling the playing field by extending subsidies and more widely to fruits and vegetable producers could be a positive step toward fighting obesity. As indicated in other segment of this paper, income inequality appears to affect health by undermining civil society. With lack of social cohesion and lower participation in political activity, less government spending on public goods education and social safety nets will take place. Therefore, any policy to reduce income inequality gap in turn can be linked to health and socioeconomic success. Even if the link between inequality and health were clearly established, the public health profession has no particular expertise in designing policies to reduce inequality and solving the problems of social justice.

Access to Healthy Food in Low-Income Areas

Low income people could have insufficient consumption of healthy foods. There are several reasons for this such as increased cost of fresh foods in low income neighborhoods, lack of public transportation to supermarkets, and few supermarkets and grocery foods in low income areas stock healthy foods. To increase access to healthy foods the following
steps can be taken including tax incentives to attract supermarkets to low income areas, increased access to public transportation and provide incentives to create more local farmers markets. Although in the present investigation major obesity is reported in high income families, it is important to specify that there are also obesity rates in the low-income quintiles. Therefore, ensuring access to healthy foods in low-income areas is important to reduce obesity levels in Peru. Our result also suggest that anti-poverty intervention might have positive effects in terms of reducing food related health inequalities.

**Roles of Advertising and Technology**

Highly processed foods were mostly focused in advertisements. Analysis of data for more than 13,000 children found that there is a significant association between the amount of time children spent watching television and the prevalence of obesity. Diets and Gortmaker (1985) concluded that, among 12-to-17 years old, the prevalence of obesity increased by 2 percent for each additional hour of TV viewed, even after controlling for other variables such as prior obesity, race, and socio-economic status. Also, these hours spend watching television contributed to a sedentary life style and an increased risk for obesity. According to the American Psychological Association, children under the age of two are more likely to accept the advertiser’s messages as truthful, accurate and unbiased. Food products mostly marketed to children include cereals, candies, sweets, sodas and snack foods. Australia, Canada, Sweden and Great Britain and Peru have adopted regulations that prohibit advertising in programs watched by young children.

In 2010, WHO endorsed a resolution that urged governments to restrict the promotion and advertising of all energy dense and low-nutritional foods and drinks to children. Since then, all countries have had to deal with the food industry’s reluctance to apply such policies that might affect its economic interests. One notable example of this situation took place in Brazil, where a draft regulatory plan (which was only partially approved) banned all advertising messages on foods aimed at children. Brazil now possesses legislation that requires all food advertisements to include warnings for products with high fat, sugar and salt content. However, the members of the Brazilian Association of Food Industries fail to apply this regulation, or they apply it only partially. Likewise, agreements have been signed with the food industries of Brazil, Mexico, Chile and Peru to regulate the content of advertisements for packaged products with low nutritional value. However, it should be stressed that these are voluntary agreements, a situation that has been severely criticized by members of academic institutions and non-governmental organizations that promote public health, child protection and consumers’ rights (Cardaci, 2013).

Media also influences behavior in a positive manner. As mentioned, options include the reduction or regulation of food advertisements that target children, in addition to the promotion of educational programs that promote healthy eating and exercise, and intervention to reduce the time children spend on media and texting. We should not forgetting that individual choice cannot be separated from the structural conditions that make it possible. Lifestyles resulting in poor health are not influenced by means of personal choice; instead they are a consequence of the economic and social circumstances in which the people have been born, and live.

**CONCLUDING COMMENTS**
The individual may have some aspirations, but these aspirations are likely to be for a complex combination of health, good looks, and weight. Further, the decision-making outcome will be determined to a great extent by the relative strength of the internal and external factors. If the negative external factors (environment) get stronger over time, as they apparently were during the last three decades, without any significant changes in the internal factors, this would indicate a rising level of obesity as has been observed.

Obesity can be the result of several interaction changes that could be either socio-demographic or economic factors. Government could exploit what cause increase in body weight in order to tackle the promotion of health education, food regulation and providing counseling in primary care. There is no single strategy that can be effective alone and rather a combination of different approaches is needed for success. Researchers say that it will take a broad set of policies applied systematically to effectively reverse the trend (Institute of Medicine Report, May 2012). The faster government take action, the lower will be the impacts of high health care costs on budget deficit. Simply put, the more the government must spend on health care and the more tax revenues it loses, the less will be available for discretionary spending (such as education, highways, the environment and defense) and providing safety net services for the nation.

None of this can be accomplished without a policy intervention from the government with support from public interest groups. Stemming the obesity epidemic cannot be separated from stemming the tide of poverty and income inequality gap. The persistence of inequality would seem to reflect a lack of policies aimed at drastically diminishing the gap between different sectors of the population, as well as the predominance of volatility in levels of income and in employment. Advocates for equity consider health to be a human right. Likewise, it champions the need to pay attention to the determining factors— at the micro, and macro levels — that are involved in any situation where a successful intervention is being planned (Cardaci, 2013).

Despite the growing concern over the increased prevalence of adolescent overweight/obesity in Latin America, little research has been conducted to measure the level of awareness of adolescents regarding the various causes and health consequences of these conditions (McArthur, et al, 2001). We can’t blame individuals and expect personal responsibility to solve the problem. Instead, we need the government to pass a suite of policy changes to encourage healthy diets.

Peru’s law is the latest in a series of efforts by Latin American countries to tackle a public health problem that has accompanied the economic boom of the past two decades—more overweight kids and an increase in non-communicable diseases such as diabetes and cardiovascular problems. But although several countries have passed laws, implementing regulations have lagged, and some public health experts are calling for international measures—such as the ones used to tackle cigarette sales—to counter what they say is powerful lobbying by the food and advertising industries (Fraser, 2013). Peru’s law immediately drew criticism from legislators, advertisers, and even the Catholic archbishop of Lima, who said that shaping children’s dietary habits was a job for parents, not the government. However, government can play an important role as the entire country will benefit if the government can head off future health problems by reducing children’s consumption of salty, sugary, and high-fat processed foods, according to Luis Fernando Leanes, who headed the Pan American Health Organization (PAHO) office in Peru. Moreover, intervention should be more focused on improving the welfare of poorer
individuals, in particular if the reason for obesity is beyond individual’s control that make them more likely to be obese.

Fallon (2015) suggested regional policy to create a healthier communities as a singular national policy to address obesity in Peru would be an ineffective use of resources. Nutrition interventions individually tailored to these diverse groups of people are more likely to have an impressionable impact.

In short, there is growing evidence that obesity in many countries is largely an economic issue. Even if the link between inequality, poverty and health were clearly established and tested, the public health profession has no particular expertise in reducing inequality and solving broader problems of social injustice, it is the responsibility of policy makers to design better policy to combat income inequality gap and poverty. Community based multiple strategies are required to combat increasing prevalence of overweight and obesity in Peru community.

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Peru Reports: https://perureports.com/poverty-inequality/
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Figure 1: Gini Coefficient, Perú: 2008-2017

Figure 2: Factors Affecting Obesity

Source: Childhood obesity causes. (Childhood obesity 180.org.)
Table 1: Weight Range

<table>
<thead>
<tr>
<th>Height</th>
<th>Weight Range</th>
<th>BMI</th>
<th>Considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>5' 9&quot;</td>
<td>124 lbs or less</td>
<td>Below 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td></td>
<td>125 lbs to 168 lbs</td>
<td>18.5 to 24.9</td>
<td>Healthy weight</td>
</tr>
<tr>
<td></td>
<td>169 lbs to 202 lbs</td>
<td>25.0 to 29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td></td>
<td>203 lbs or more</td>
<td>30 or higher</td>
<td>Obese</td>
</tr>
</tbody>
</table>

Source: National Center for Health Statistics, 2011
Table 2: Percentage of Obese Women between 15-49 Years Old by Characteristics, 2008 and 2017

<table>
<thead>
<tr>
<th>Selected Characteristic</th>
<th>Overweight/Obesity</th>
<th>2008</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Overweight/Obesity</td>
<td>&gt;=25.0</td>
<td>25.0-29.9 Only Overweight</td>
</tr>
<tr>
<td>Residence Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td>52.1</td>
<td>35.4</td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td>40.9</td>
<td>31.9</td>
</tr>
<tr>
<td>Natural Region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lima</td>
<td></td>
<td>52.5</td>
<td>35.7</td>
</tr>
<tr>
<td>Metropolitana</td>
<td></td>
<td>54.0</td>
<td>35.3</td>
</tr>
<tr>
<td>Rest Coast</td>
<td></td>
<td>44.5</td>
<td>33.5</td>
</tr>
<tr>
<td>Mountain Range</td>
<td></td>
<td>43.7</td>
<td>32.1</td>
</tr>
<tr>
<td>Jungle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td></td>
<td>20.7</td>
<td>18.5</td>
</tr>
<tr>
<td>20-29</td>
<td></td>
<td>40.3</td>
<td>31.7</td>
</tr>
<tr>
<td>30-39</td>
<td></td>
<td>60.3</td>
<td>41.4</td>
</tr>
<tr>
<td>40-49</td>
<td></td>
<td>68.7</td>
<td>42.1</td>
</tr>
<tr>
<td>Level Of Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without Education</td>
<td></td>
<td>49.9</td>
<td>39.0</td>
</tr>
<tr>
<td>Primary Education</td>
<td></td>
<td>53.1</td>
<td>35.4</td>
</tr>
<tr>
<td>Secondary Education</td>
<td></td>
<td>48.9</td>
<td>34.1</td>
</tr>
<tr>
<td>Higher Education</td>
<td></td>
<td>45.8</td>
<td>33.7</td>
</tr>
<tr>
<td>Wealth Quintile</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Quintile</td>
<td></td>
<td>32.8</td>
<td>28.8</td>
</tr>
<tr>
<td>Second Quintile</td>
<td></td>
<td>41.6</td>
<td>32.5</td>
</tr>
<tr>
<td>Intermediate Quintile</td>
<td></td>
<td>51.2</td>
<td>35.1</td>
</tr>
<tr>
<td>Fourth Quintile</td>
<td></td>
<td>55.4</td>
<td>37.2</td>
</tr>
<tr>
<td>Higher Quintile</td>
<td></td>
<td>50.5</td>
<td>34.5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>49.1</td>
<td>34.4</td>
</tr>
</tbody>
</table>

### Table 3: Regions with Highest Obesity Rates among Women, in Peru, 2017

<table>
<thead>
<tr>
<th>Twelve Regions with Women' Highest Obesity Rates</th>
<th>Percent of Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madre de Dios</td>
<td>35.03</td>
</tr>
<tr>
<td>Tacna</td>
<td>34.92</td>
</tr>
<tr>
<td>Tumbes</td>
<td>31.76</td>
</tr>
<tr>
<td>Moquegua</td>
<td>31.67</td>
</tr>
<tr>
<td>Ica</td>
<td>30.08</td>
</tr>
<tr>
<td>Lima</td>
<td>25.69</td>
</tr>
<tr>
<td>Lambayeque</td>
<td>25.02</td>
</tr>
<tr>
<td>Áncash</td>
<td>24.87</td>
</tr>
<tr>
<td>Ucayali</td>
<td>23.62</td>
</tr>
<tr>
<td>Piura</td>
<td>23.10</td>
</tr>
<tr>
<td>La Libertad</td>
<td>22.97</td>
</tr>
<tr>
<td>Loreto</td>
<td>21.56</td>
</tr>
</tbody>
</table>

*Source: Family Health and Demographic Survey (ENDES), 2017.*

### Table 4: Regions with Lowest Obesity Rates for Women, Peru, 2017

<table>
<thead>
<tr>
<th>Twelve Regions with Lowest Women Obesity Rates</th>
<th>Percent of Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arequipa</td>
<td>20.71</td>
</tr>
<tr>
<td>San Martín</td>
<td>20.11</td>
</tr>
<tr>
<td>Cajamarca</td>
<td>18.63</td>
</tr>
<tr>
<td>Cusco</td>
<td>17.79</td>
</tr>
<tr>
<td>Puno</td>
<td>17.53</td>
</tr>
<tr>
<td>Apurímac</td>
<td>16.97</td>
</tr>
<tr>
<td>Amazonas</td>
<td>16.90</td>
</tr>
<tr>
<td>Ayacucho</td>
<td>16.78</td>
</tr>
<tr>
<td>Huánuco</td>
<td>15.26</td>
</tr>
<tr>
<td>Junín</td>
<td>15.10</td>
</tr>
<tr>
<td>Pasco</td>
<td>14.95</td>
</tr>
<tr>
<td>Huancavelica</td>
<td>12.00</td>
</tr>
</tbody>
</table>

*Source: Family Health and Demographic Survey (ENDES), 2017.*
Table 5: Panel unit root test (level)

<table>
<thead>
<tr>
<th>Variable</th>
<th>LLC</th>
<th>Breitung</th>
<th>IPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>l_obesity</td>
<td>-13.33***</td>
<td>-1.60</td>
<td>-1.13</td>
</tr>
<tr>
<td>l_poverty</td>
<td>-6.64***</td>
<td>-0.44</td>
<td>0.28</td>
</tr>
<tr>
<td>l_gini</td>
<td>-13.70***</td>
<td>-2.62***</td>
<td>-1.64***</td>
</tr>
</tbody>
</table>

N.B: LLC=Levin, Lin, Chu (2002), IPS=Im, Pesaran, Shin (2003). The other statistics are described in detail in Breitung (2000). The statistics are asymptotically distributed as standard normal with a left-hand side rejection area. A *** indicates the rejection of the null hypothesis of nonstationarity (LLC, Breitung, IPS) at 1% level of significance.

Table 6: Panel Unit Root Test (1st Difference)

<table>
<thead>
<tr>
<th>Variable</th>
<th>LLC</th>
<th>IPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>l_obesity</td>
<td>-12.07***</td>
<td>-5.75***</td>
</tr>
<tr>
<td>l_poverty</td>
<td>-7.52***</td>
<td>-2.64***</td>
</tr>
<tr>
<td>l_gini</td>
<td>-11.17***</td>
<td>-5.70***</td>
</tr>
</tbody>
</table>

N.B: LLC=Levin, Lin, Chu (2002), IPS=Im, Pesaran, Shin (2003). The statistics are asymptotically distributed as standard normal with a left-hand side rejection area. A *** indicates the rejection of the null hypothesis of nonstationarity (LLC, Breitung, IPS) at 1% level of significance.

---

3 For the case of variables in differences, the Breitung test (2000) is omitted because it is based on a specification with individual intercept and trend.
Table 7: Panel Cointegration test (Pedroni, 1999)

<table>
<thead>
<tr>
<th>Test</th>
<th>Panel Statistics</th>
<th>Group Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance ratio</td>
<td>0.7780</td>
<td>-</td>
</tr>
<tr>
<td>Rho statistics</td>
<td>3.0263</td>
<td>4.7365</td>
</tr>
<tr>
<td>PP statistics</td>
<td>-7.6893***</td>
<td>-10.5434***</td>
</tr>
<tr>
<td>ADF statistics</td>
<td>-6.0411***</td>
<td>-6.4490***</td>
</tr>
</tbody>
</table>

N.B: Statistics are asymptotically distributed as standard normal. The Pedroni statistics are described in detail in Pedroni (1999). The variance ratio test is right-sided, while the other Pedroni tests are left-sided.

Table 8: Cointegrating regression (FMOLS)
Dependent Variable: L_OBESITY
Method: Panel Fully Modified Least Squares (FMOLS)
Panel method: Pooled estimation
Cointegrating equation deterministics: C
Coefficient covariance computed using default method
Long-run covariance estimates (Bartlett kernel, Newey-West fixed bandwidth)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_POVERTY</td>
<td>-0.460579</td>
<td>0.059765</td>
<td>-7.706443</td>
<td>0.0000</td>
</tr>
<tr>
<td>L_GINI</td>
<td>-0.250626</td>
<td>0.138767</td>
<td>-1.806090</td>
<td>0.0725</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.825193</td>
<td>Mean dependent var</td>
<td>2.869390</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.802193</td>
<td>S.D. dependent var</td>
<td>0.358183</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.159304</td>
<td>Sum squared resid</td>
<td>4.821760</td>
<td></td>
</tr>
<tr>
<td>Long-run variance</td>
<td>0.033031</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

****p<0.01, **p<0.05, *p<0.10
N.B: Panel method is pooled estimation. The Cointegration equation is deterministic. We use Bartlett kernel lag and Newey-West fixed standard error of residuals.

For the purpose of the test, the specification with trend and intercept was used since all the series in level present these verified elements via plots of the series as well as a nonzero average test.
Table 9: Cointegrating regression (FMOLS) residuals (level) panel unit root test

<table>
<thead>
<tr>
<th>Method</th>
<th>Statistic</th>
<th>Probability</th>
<th>Cross-sections</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levin, Lin &amp; Chu t*</td>
<td>-9.18164</td>
<td>0.0000***</td>
<td>24</td>
<td>168</td>
</tr>
<tr>
<td>Null: Unit root (assumes common unit root process)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADF - Fisher Chi-square</td>
<td>124.512</td>
<td>0.0000***</td>
<td>24</td>
<td>168</td>
</tr>
<tr>
<td>PP - Fisher Chi-square</td>
<td>151.948</td>
<td>0.0000***</td>
<td>24</td>
<td>192</td>
</tr>
</tbody>
</table>

****p<0.01, **p<0.05, *p<0.10

Table 10: Panel causality test

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>L_POVERTY does not homogeneously cause L_OBESITY</td>
<td>5.04200</td>
<td>5.17342</td>
<td>0.0000***</td>
</tr>
<tr>
<td>L_OBESITY does not homogeneously cause L_POVERTY</td>
<td>2.35840</td>
<td>1.25377</td>
<td>0.2099</td>
</tr>
<tr>
<td>L_GINI does not homogeneously cause L_OBESITY</td>
<td>2.46006</td>
<td>1.40226</td>
<td>0.1608</td>
</tr>
<tr>
<td>L_OBESITY does not homogeneously cause L_GINI</td>
<td>2.65731</td>
<td>1.69037</td>
<td>0.0910*</td>
</tr>
<tr>
<td>L_GINI does not homogeneously cause L_POVERTY</td>
<td>2.06478</td>
<td>0.82492</td>
<td>0.4094</td>
</tr>
<tr>
<td>L_POVERTY does not homogeneously cause L_GINI</td>
<td>2.10050</td>
<td>0.87709</td>
<td>0.3804</td>
</tr>
</tbody>
</table>

****p<0.01, **p<0.05, *p<0.10

N.B: This test is performed through Dumitrescu and Hurlin (2012).

---

5 The unit root tests were performed using the specification without trend and without intercept. This is because, the residuals of the long-term model does not present these components.
## APPENDIX

### Table A1: Description of the variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unit</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>obesity</td>
<td>In Body Mass Index (BMI). The natural logarithm of BMI index, which is more than 30, is used as the variable “obesity”.</td>
<td>The body mass index (BMI), or Quetelet index, is a value derived from the mass (weight) and height of an individual. The BMI is defined as the body mass divided by the square of the body height and is universally expressed in units of kg/m², resulting from weight in kilograms and height in metres. If pounds and inches are used, a conversion factor of 703 (kg/m²)/(lb/in²) must be applied. When the term BMI is used informally, the units are usually omitted. Commonly accepted BMI ranges are underweight: under 18.5, normal weight: 18.5 to 25, overweight: 25 to 30, obese: over 30. The data structure is in panel and the data is collected from 2008 to 2017 for all regions in Peru.</td>
<td>Demographic and Family Health Survey (ENDES – INEI) <a href="https://proyectos.inei.gob.pe/endes/">https://proyectos.inei.gob.pe/endes/</a></td>
</tr>
<tr>
<td>poverty</td>
<td>In percentage. The variable is measured as the natural logarithm of the percentage.</td>
<td>Poverty is measured as the number of persons below the poverty line and is expressed as percentage. In Peru, the official poverty definition supported by the National Institute of Statistics and Informatics (INEI, 2000) uses the poverty line method is used for consumption, the value of all the goods and services consumed by the household is incorporated, regardless of the form of acquisition or attainment. The use of consumer spending has the advantage that is the best indicator to measure well-being, because it refers to what a household consumes and not what it can potentially consume when measured by income. Another favorable aspect is that consumption is one more variable stable income, which allows a better measurement of the poverty level trend. In the estimates of consumption expenditure made by the National Institute of Statistics and Informatics (INEI), all sources of expenditure are considered, monetary expenditure, as well as the</td>
<td>National Household Survey on Living Conditions and Poverty (ENAHO-INEI) <a href="http://iiinei.in">http://iiinei.in</a> ei.gob.pe/microdontos/</td>
</tr>
</tbody>
</table>
various forms of acquisition of goods and services that do not imply a monetary payment of part. This last group includes self-consumption and self-supply, as well as in-kind payments that come from households' own economic activities and also the elements of expenditure received by transfers from other households or by part of public and private organizations. Likewise, within the components of expenditure, expenses in health and public education are excluded, due to the lack of adequate prices to value said services consumed by households. Finally, the imputation for the consumption of river water or ditch is also excluded, because the degree of transformation of said goods is almost nil and there is no commercial value that allows an adequate valuation.

The data structure is in panel and the data is collected from 2008 to 2017 for all regions in Peru.

| gini | In ratios. The variable is measured as the natural logarithm of the percentage. Gini coefficient is used to measure the extent of inequality. In econometric specification, we denote it as \( l_{\text{gini}} \). The Gini coefficient is a measure of inequality of variance. It is often applied to measure inequality of incomes in a particular area. A score of "0" on the Gini coefficient represents complete equality, i.e., every person has the same income. A score of 1 would represent complete inequality, i.e., where one person has all the income and others have none. The information was tabulated from the National Household Survey on Living Conditions and Poverty (ENAHO-INEI) conducted by the National Institute of Statistics and Informatics (INEI). We refer gini coefficient as income gini coefficient and the ratio measures the extent of income inequality. The data structure is in panel and the data is collected from 2008 to 2017 for all regions in Peru. |
| National Household Survey on Living Conditions and Poverty (ENAHO-INEI) | http://iinei.inei.gob.pe/microdatos/ |
Table A2: Correlation of the variables

<table>
<thead>
<tr>
<th>Correlation/Probability</th>
<th>L_OBESITY</th>
<th>L_POVERTY</th>
<th>L_GINI</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_OBESITY</td>
<td>1.000000</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>L_POVERTY</td>
<td>0.774750</td>
<td>1.000000</td>
<td>0.0000</td>
</tr>
<tr>
<td></td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>L_GINI</td>
<td>-0.536908</td>
<td>0.589959</td>
<td>1.00000</td>
</tr>
</tbody>
</table>

****p<0.01, **p<0.05, *p<0.10
Table A3: Percentage of women 15-49 years old with obesity (IMC >= 30.0) in the different regions in Peru

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazonas</td>
<td>8.90</td>
<td>11.90</td>
<td>8.83</td>
<td>8.70</td>
<td>12.53</td>
<td>14.36</td>
<td>15.81</td>
<td>16.02</td>
<td>17.65</td>
<td>16.90</td>
</tr>
<tr>
<td>Apurímac</td>
<td>8.90</td>
<td>11.00</td>
<td>9.44</td>
<td>8.50</td>
<td>11.69</td>
<td>15.37</td>
<td>14.34</td>
<td>13.95</td>
<td>15.44</td>
<td>16.97</td>
</tr>
<tr>
<td>Arequipa</td>
<td>16.00</td>
<td>16.50</td>
<td>17.09</td>
<td>20.20</td>
<td>23.42</td>
<td>24.24</td>
<td>24.02</td>
<td>20.98</td>
<td>20.25</td>
<td>20.71</td>
</tr>
<tr>
<td>Ayacucho</td>
<td>8.30</td>
<td>7.40</td>
<td>9.20</td>
<td>12.30</td>
<td>13.27</td>
<td>14.83</td>
<td>15.20</td>
<td>17.15</td>
<td>16.78</td>
<td></td>
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Peru 14.60 15.70 15.80 17.00 17.93 20.22 20.90 20.92 21.20 22.91

Graph A1: The relationship between obesity and poverty in the different regions in Peru

High income regions have higher rates of obesity.

Poorest regions have lower obesity rates.

Source: ENDES and INEI.
Pennsylvania Economic Association
2019 Conference Proceedings

Graph A2: The relationship between obesity and income inequality in the different regions in Peru
ANALYSIS OF YIELD IN REAL ESTATE

Malek Lashgari
University of Hartford
Johannes Schermund

ABSTRACT

This empirical study is concerned with the role of the yield in real estate in explaining the later observed growth in income or price of real estate assets. The yield in residential property as measured by the ratio of rent to the observed price of the property, known as the real estate yield, appears to convey information regarding the future growth in rent or value of the property. We use both the observed and implied rent. We apply the basic valuation model in the analysis of common stock to the real estate market. Overall, the results are in support of some of the prior empirical studies, while using different data and recent time horizon.

INTRODUCTION

The objective of this research is to analyze and evaluate the relationship between the real estate yield with house value, the expected growth in house prices, and the cost of money. If the value of real estate—the land and structure—depends on its yield, then its price behavior is similar to common stock and bonds, and factors affecting common stock or bonds will help in explaining the value of real estate. In this line of reasoning, the level of rent, expected growth in rent, and the cost of capital appear to play an important role in the determination of real estate value.

Gallin (2004) examines the information content of the ratio of rent to price, known as the rent price multiple, in forecasting the changes in growth rates for subsequent rent or price. By comparing the scatter plot of data during 1970-2003, and regression analysis, he finds that a low rent/price ratio is followed by a relatively higher real growth, adjusted for inflation, in rent during the subsequent three-year time horizon. At the same time, when the rent to price ratio is low, subsequent real growth in price is low. Meanwhile, the scatter plot of rent/price ratio as compared to the user cost of capital, as a measure of discount rate, shows that when discount rate is rising, the rent/ price ratio is rising, and when discount rate is falling the rent/price ratio is falling. By way of combination of the above empirical observations and analyses, Gallin finds support for the standard valuation model, as used in the analysis of common equity, in residential structure.

Clark (1995) provides empirical evidence in support of the house price being the discounted value of future earnings. He uses the median rents and prices from Decennial Census data over the decades of 1950s, 1960s, 1970s, and 1980s. He uses the growth rate in rent over a 10-year future time horizon and the current rent/price ratio. That is, the current rent/price ratio and future growth in rent show inverse correlation over time: When rent/price ratio is high, future growth in rent is low.
RESEARCH METHODOLOGY

An asset price should fully reflect the expected future benefits for it to be at the equilibrium level; neither overpriced, nor undervalued. In a time-dependent cash flow discount mechanism, accurate forecasts for both the future cash flows and the rate of discount are needed. Given a constant discount rate, the current price should be the total sum of the present value of the future cash flows.

\[ P_t = \sum_{t=1}^{n} \frac{C_{t+1}}{(1+k)^{t+1}} \]  

(1)

Here, \( C \) denotes cash flows, and \( k \) denotes the discount rate.

That is,

\[ P_0 = \frac{C_1}{(1+k)^1} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \ldots \]  

(2)

The reduced model of eq. (2), known as the Gordon Model, for valuing a share of common stock, is eq. (3), considering the stream of dividends (D) as the cash flows.

\[ P_0 = \frac{D_1}{k-g} \]  

(3)

Here, \( P_0 \) denotes the fair value of the common stock,
\( k \) denotes the required return, or the discount rate, and
\( g \) denotes the expected long run growth rate.

By rearranging the terms in eq. (3), the Gordon Model is shown in eq. (4) as follows.

\[ g_t = k - \frac{D_{t+1}}{P_t} \]  

(4)

This methodology appears to be applicable to real estate as set forth here. If the value of real estate is a function of its cash flows, then,

\[ Price = f(\text{rent, growth in rent, and the cost of money}) \]  

(5)

And its reduced form can be shown as in eq. (6),

\[ \text{Real Estate Yield} = \text{cost of money} \times \text{expected growth in rent} \]  

(6)

In eq. (6), if the real estate yield is higher than its historical average value, then either the expected growth in rent, or price, is low or the cost of money is higher than its expected value. Eq. (6) follows as in eq. (7).

\[ \frac{R_{t+1}}{P_t} = k - g_{t+1} \]  

(7)

Here \( R_{t+1} \) denotes expected rent,
\( P_t \) denotes the current price,
\( g_{t+1} \) denotes expected growth in rent or price,
\( k \) denotes the cost of money.

Intuitively, eq. (7) shows that, in equilibrium, the rent yield is the net cost of money. Regression analysis follows eq. (8).
$$\log \frac{\text{Rent}_{t+1}}{\text{Rent}_t} = a + b \frac{\text{Rent}_{t+1}}{P_t} + e_{t+1}$$  \hspace{1cm} (8)$$

Where \((t+1)\) and \((t)\) denote next year and current year, respectively,

- \(\log \frac{\text{Rent}_{t+1}}{\text{Rent}_t}\) denotes the growth in rent,
- \(\frac{\text{Rent}_{t+1}}{P_t}\) denotes the rent yield,
- \(a\) denotes the intercept of the regression line and it is an estimate of cost of money,
- \(b\) denotes the slope coefficient of the regression line.

Thus, the growth in rent during this year is a function of this year’s yield in rent and the discount rate \((a)\), noting that \((a)\) is an estimate of \(k\), the discount rate.

**EMPIRICAL FINDINGS**

Table 1 shows the information regarding the change in the real estate yield on the change in growth. Panel A includes the results for the 20-city index, and panel B for the 10-city index. Rent is measured as direct or the owner equivalent rent, and the results are shown in Table 1.1 for rent, and Table 1.2 for the owner equivalent rent. We find that the real estate yield, as measured by the rent to price ratio, explains the change in growth and it appears that rising or higher levels of real estate yield is tied to a falling or a lower level of growth in rent, and that the real estate yield is inversely related to the growth in rent. Furthermore, the Gordon model for valuation of common stock appears to be applicable to the real estate price and rent and the growth in rent. These conclusions are in line with the findings of Gallin (2004) and Clark (1995).

**CONCLUSION**

We find that the real estate yield, as measured as the rent to price ratio, explains the change in growth and it appears that rising or higher levels of real estate yield are tied to a falling or a lower level of growth. When the yield on real estate is high, it appears to convey information that the expected growth in price or rent would be low.

**REFERENCES**


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Explanation for Table 1.1:
Model 1 is a regression of the growth in the CPI Urban Consumers Rent of Primary Residence index onto Case-Shiller 20-City yields based on the CPI Urban Consumers Rent of Primary Residence index and the Owners' Equivalent Rent of Residences index. The timeframe for the regressed data ranges from January 2001 to October 2018 and observations are monthly.
Model 2 is a regression of the growth in the CPI Urban Consumers Rent of Primary Residence index onto Case-Shiller 10-City yields based on the CPI Urban Consumers Rent of Primary Residence index and the Owners' Equivalent Rent of Residences index. The timeframe for the regressed data ranges from January 1988 to October 2018, observations are monthly.
Table 1.2

Panel A

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Panel B

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Explanation for Table 1.2:
Model 1 is a regression of the growth in the CPI Urban Consumers Owners' Equivalent Rent of Residences index onto Case-Shiller 20-City yields based on the CPI Urban Consumers Rent of Primary Residence index and the Owners' Equivalent Rent of Residences index. The timeframe for the regressed data ranges from January 2001 to October 2018 and observations are monthly.
Model 2 is a regression of the growth in the CPI Urban Consumers Owners' Equivalent Rent of Residences index onto Case-Shiller 10-City yields based on the CPI Urban Consumers Rent of Primary Residence index and the Owners' Equivalent Rent of Residences index. The timeframe for the regressed data ranges from January 1988 to October 2018 and observations are monthly.
Growth in CPI Urban Consumers Rent of Primary Residence and Owners' Equivalent Rent of Residences are as follows:
\begin{align*}
\ln\left(\frac{Rent_{t_0}}{Rent_{t_{-12}}}\right), & \quad \ln\left(\frac{Owners' Equivalent_{t_0}}{Owners' Equivalent_{t_{-12}}}\right) \\
\end{align*}

The yield of the Case-Shiller 20- & 10-City index over the CPI Urban Consumers Rent of Primary Residence index & Owners' Equivalent Rent of Residences index are as follows:

\begin{align*}
\frac{Rent_{t_{-12}}}{20-City index_{t_{0}}}, & \quad \frac{Owners' Equivalent_{t_{-12}}}{20-City index_{t_{0}}} \\
\frac{Rent_{t_{-12}}}{10-City index_{t_{0}}}, & \quad \frac{Owners' Equivalent_{t_{-12}}}{10-City index_{t_{0}}} \\
\frac{Rent_{t_{-12}}}{Owners' Equivalent_{t_{-12}}}, & \quad \frac{Owners' Equivalent_{t_{-12}}}{Owners' Equivalent_{t_{-12}}} \\
\end{align*}

Data are seasonally adjusted, and indices are scaled to January 2000 = 100.

**Data sources Table 1**

St. Louis Fed (Series Name):
- S&P Case-Shiller 20-City Composite Home Price Index (SPCS20RSA)
- S&P Case-Shiller 10-City Composite Home Price Index (SPCS10RSA)
- Consumer Price Index for All Urban Consumers: Rent of primary residence (CUUR0000SEHA)
- Consumer Price Index for All Urban Consumers: Owners' equivalent rent of residences (CUSR0000SEHC)
THE EFFECT OF OFFICIAL DEVELOPMENT ASSISTANCE ON HEALTH IN SUB-SAHARAN AFRICA

Sierra Loehrer
Clarion University

ABSTRACT

The role of foreign aid on the development of emerging economies has been widely disputed in academia in recent years. Using multiple regression estimations, this paper analyzes the relationship between official development assistance (ODA) and life expectancy as a measure of overall health in Sub-Saharan Africa while controlling for government health expenditure, corruption, prevalence of HIV, and mean years of schooling. Based on the hypothesis that the greater the ODA is the longer the life expectancy, this study obtains implications for future government policies and decision-making.

INTRODUCTION

“Why do some countries develop earlier than others? Why do some countries fail to develop while others are successful?” (Roland, 2016). These questions have been plaguing development economists since the creation of the field. Sub-Saharan Africa remains one of the poorest and least-developed regions in the world. This paper examines the role of foreign aid on the development of countries within this region focusing on the healthcare sector. Specifically, does official development assistance positively affect the life expectancy in the nations of Sub-Saharan Africa?

To answer this question, there will first be a review of the existing literature surrounding foreign aid effectiveness. Next, the data and methods used for the multiple regression estimations will be presented. Then, the results and implications of the analysis will be discussed. And finally, the paper will conclude with an overall discussion of the topic and suggestions for future policies and actions.

LITERATURE REVIEW

The issue of foreign aid effectiveness can be examined from many different angles. Some argue that aid can be helpful in economic and human development. Some argue that foreign aid creates dependence that can harm the development of poor nations. Other schools of thought fall somewhere in between these two extremes. This review will highlight the major issues being discussed within this debate.

Cases in Favor of Foreign Aid

Win & Cho found that there is a negative relationship between foreign aid and infant mortality rate. Their study examined three countries at different levels of development in Asia: Myanmar, Cambodia, and Vietnam, with a focus on the healthcare sector. Foreign aid
had a statistically significant impact on infant mortality rate. GDP growth, corruption, rate of HIV/AIDS, sanitation facilities, and population were also significant. They argue that Myanmar’s government should align its foreign aid allocation with the Millenium Development Goals (now called Sustainable Development Goals) and the goals of other international development organizations. They should also follow the patterns of Korea and Vietnam, who have had greater success in human development. According to Win & Cho, donor countries should not interfere in the planning and decision-making process of recipient countries, but that transparency and monitoring of results are important. Yogo & Mallaye also found a positive relationship between foreign aid and health outcomes. Their study looked at 34 countries in Sub-Saharan Africa over the period of 1990-2012 and focused on child mortality and HIV prevalence. It is important to note that this study only examined aid that was allocated to the healthcare sector specifically. They found that for each additional unit of health aid, HIV decreases by 8.3 percent and child mortality decreases by 51 percent. These results can be explained by increases in health expenditure and female education. Health aid was not found to be more effective in post-conflict situations. In 2017, Yogo conducted another study that assessed the effectiveness of sector-specific aid for 35 Sub-Saharan Africa countries for the period 2000-2010, focusing on education. He determined that higher aid allocations in education significantly increased primary school completion rates, however current levels of aid must be at least doubled to accomplish current SDG’s.

Baldé argues that foreign aid can act as a complement to remittances, which are an increasingly important topic in the progress of the least-developed nations. Over the past 35 years, the number of people living outside their country of origin has more than doubled, with about 190 million in 2005. Africa showed the largest increase of skilled migrants living in developed countries, at 113 percent between 1990 and 2000. Small economies are most dependent on remittances, which account for a large portion of their GDP. He argues that savings and investment, which are necessary factors of growth, are dependent on permanent income. Recipient countries have an incentive to promote poor economic policies to continue being eligible for aid and that government spending on infrastructure decreases funds available for national saving. Remittances may be more effective because they are received directly by those in need, not by the government acting as an intermediary. Common motives to send remittances include helping family, building houses, building infrastructure, starting a business, and opening a savings account. The initial level of development is important because it determines whether increased income will be used for consumption or savings and investment. Foreign aid can be complementary to remittances by allowing income levels to move beyond subsistence consumption. Remittances and foreign aid both positively affect savings and investment in Sub-Saharan Africa. Though the volume of remittances is lower, they have a more significant effect on savings. They are not substitutable because remittances cannot be used for public projects such as roads, trains, and airports. Countries receiving high volume of remittances should put policies in place to increase the complementarities between them and foreign aid, thus allowing them to be used more productively. Remittances should be allowed and encouraged due to their ability to add productivity to the recipients of foreign aid.

In comparison, Cacares & Cacares argue that national and external savings do not affect socioeconomic growth as much as HDI and rule of law (governance/institutions). These factors will lead to higher savings rates in the future, as well as less reliance on external factors. Due to contagion effects, this stability and growth will affect the global community. Human development can decrease external vulnerability and economic instability by
increasing internal savings. There is evidence that solid institutions increase life expectancy and literacy, and that private investment relies more on a healthy population with skills and education, abundant human capital, and solid institutions than on national and external savings. Malnutrition and vitamin deficiencies during childhood can also affect school performance, while education affects crime rates. These findings show the interconnectedness of different human development focuses, suggesting a more comprehensive allocation of funds may be necessary.

Like Baldé, they found that capital in Africa is not as productive as it could be. However, they attribute this to the lack of development in human capital rather than a lack of savings and investment. They believe there should be stronger organizations to protect human development during economic downturns the way international financial organizations protect the balance of payments for countries during these times. Human development and governance should hold the highest priority. They should take precedence over structural adjustment, economic opening, and financial liberalization.

**Cases Opposed to Foreign Aid**

Cacares & Cacares stated: “An implication is that governance can be strengthened by increasing the attention to the social sectors, namely health and education; or in other words, increasing levels of human development may empower citizens to demand solid institutions.” This applies to foreign aid in that donor countries are more willing to provide aid as a reward for improved governance or institutional quality in the short term. However, in the long term good institutions decrease the need for foreign aid. Higher education levels also lead to larger national savings rates and decrease the need for aid. Reliance on aid can perpetuate cycles of economic instability and vulnerability. This suggests that foreign aid may not be the most effective tool in promoting economic development. Asongu agrees, claiming that the effectiveness of foreign aid is dependent on the level of institutional quality, but that foreign aid itself may also mitigate institutional development. “A substantial literature on institutions and development suggests that Africa is poor because it is deficient of good institutions: dictatorships, lack of property rights, weak courts and contract-enforcement, political instability, high corruption, violence, and hostile regulatory environment for private business.” The perilous character of development assistance to institutional quality has been broadly confirmed in 53 African countries for the period 1996-2010. Adam & O’Connell agree that institutional performance has a strong impact on development, arguing that institutional failures produce policy failures which lead to capital shortages. Donor countries have strong bargaining power but are also being challenged regarding the effectiveness of aid from parties at home. Some studies suggest that aid should be directed towards nations which already have solid institutions. However, unconditional aid is subject to decreasing marginal return even with more favorable initial conditions. Adam & O’Connell admit that there are positive and negative aspects of conditionality, a situation in which aid is only offered to nations who satisfy a set of conditions.

**Cases of Centrality**

Bearce & Tirone argue that foreign aid can be effective but only if the strategic benefits for the donor countries are small. In other words, foreign aid given for developmental, not strategic or geopolitical reasons can be economically effective. This is true because recipient
governments tend to “misspend” aid. “Foreign aid serves as a bribe offered to developing country governments in order to encourage them to engage in economic reform.” These reforms can be politically costly due to short-term effects on the population. Economic reform includes creating and opening markets, reducing barriers to international trade, deregulation, increased property rights, and improved law and order. They agree with Win & Cho regarding the importance of monitoring and enforcement but go one step further to say that conditionality is ineffective due to the inability to accomplish these tasks. Specifically, if there is strategic benefit to providing aid, conditionality often fails to follow through. Donor nations have different incentives for providing aid. The U.S. is driven by a desire to develop military relationships. The British and French aim to maintain political influence in former colonies. Japan and Germany focus on increasing their own economic power. Conditionality also fails due to the incentives it creates for recipient nations. As a recipient government increases their economic freedom, further reform becomes more difficult. This corresponds to Baldé’s statement about nations remaining at lower levels of development to maintain aid eligibility.

Despite these assumptions, Bearce & Tirone found that there is a strong positive correlation between foreign aid and economic reform in the post-1990 period. A one standard deviation increase in Western aid brought about one-third of the necessary economic reform associated with being an Asian Tiger. Foreign aid effectiveness increases significantly after 1990, suggesting that the strategic benefits and enforcement of conditionality led to this increase. They predict a decrease in aid effectiveness after 2001 due to the “War on Terror”. This corresponds to Cacares & Cacares’s theory about vulnerability and cyclical economic downturn created by foreign aid. Adedokun conducted a study whose results showed an insignificant negative relationship between foreign aid and economic growth in Sub-Saharan Africa, however, the impact of aid varied widely across countries. East and Southern Africa have relatively better governance which could explain why their aid effectiveness was higher than in West and Central Africa. Aid can also be more effective in non-oil producing countries due to the absence of rent-seeking behavior. Adedokun found that governance and the size of aid both influence aid effectiveness, confirming the viewpoints of Asongu and Adam & O’Connell.

In conclusion, “international aid affects recipient economies in extremely complex ways and through multiple and changing channels” (Edwards, 2015). This paper will contribute to the existing literature by examining foreign aid through the lens of official development assistance (ODA) as it affects life expectancy, which is used to measure overall health.

DATA AND METHODS

This study will use a pooled least squares multiple regression model to compare the dependent variable, life expectancy, to the independent variables: official development assistance, government health expenditure, corruption, prevalence of HIV, and mean years of education. The model considers life expectancy(Y) to be a function of ODA(X₁), HE(X₂), CPI(X₃), HIV(X₄), and SCH(X₅). A sample of 48 countries all located in the Sub-Saharan Africa region were used in the analysis. The primary relationship being observed is that between health and foreign aid, or Y compared to X₁. For the sake of clarity, relevant data used in the analysis is included in Table 1.

To offer a visual representation of data correlation, two scatter diagrams are provided for the countries of Angola and Benin (Table 2 and Table 3, respectively). The first graph
shows a negative correlation between ODA and life expectancy, while the second graph shows a slight positive correlation. This varying result agrees with the literature, stating that the effectiveness of aid varies widely country-to-country.

The main hypothesis being tested in this study is that life expectancy and ODA will have a positive relationship. For the other included variables, health expenditure is expected to have a positive relationship with life expectancy, corruption as measured by the CPI is expected to have a positive relationship with life expectancy (higher CPI score indicates lower levels of corruption), prevalence of HIV is expected to have a negative relationship with life expectancy, and mean years of education is expected to have a positive relationship with life expectancy. Descriptive statistics are found in Table 4 and a correlation matrix is found in Table 5.

The results show the strongest correlation between ODA and health expenditure, life expectancy and mean years of schooling, and prevalence of HIV with mean years of schooling. The relationship between ODA and health expenditure is logical because ODA would increase governmental income overall, which would allow for increased spending in the healthcare sector. The relationship between life expectancy and mean years of schooling corresponds to the literature which states that “there is empirical evidence on the detrimental effect that vitamin and iron deficiencies during childhood exerts on subsequent cognitive ability and school desertion” (Cacares & Cacares, 2015). And the relationship between HIV prevalence and mean years of schooling is consistent with Yogo & Mallaye’s theory that increases in education, specifically female education, promotes overall health of the population.

EMPIRICAL RESULTS

The results of the multiple regression model (Table 6) indicate that there is a slight negative relationship between ODA and life expectancy until Model 4, where the sign becomes positive but there is no longer statistical significance. This disproves the hypothesis that there would be a positive relationship between ODA and life expectancy. The results for health expenditure vary among the different models, showing statistical significance only in Model 5, where there is a slight negative correlation. This could highlight an ineffective use of funds allocated to the healthcare sector. It could also be explained by health expenditure focusing on other goals such as lowering infant mortality rate, or simply an unreliable data set.

The results for HIV showed a strong negative correlation to life expectancy and statistical significance in all five models. This confirms the previous hypothesis that life expectancy in Africa is highly affected by the prevalence of HIV and AIDS. Mean years of schooling showed a strong positive correlation with life expectancy and had statistical significance across the board. This confirms the previous hypothesis and supports the literature that compares healthcare and educational outcomes. The results for corruption show a positive economic significance and statistical significance. This confirms the previous hypothesis that less corruption corresponds to better health and is consistent with the study done by Win & Cho which found corruption to be significantly related to infant mortality.

Model 6 compares the variables holding the individual country effects fixed while Model 7 uses random effects. For ODA, there is little discrepancy between Model 5 and Models 6 and 7, reinforcing the conclusion that there is not a strong correlation between
ODA and life expectancy. Health expenditure becomes positive in the last two models but loses statistical significance. For prevalence of HIV and mean years of schooling, the data remains statistically significant and the correlation becomes stronger for Models 6 and 7, strengthening the implied causal relationship between the variables. For CPI, the final models show a weaker correlation, but only slightly. Overall, adding fixed and random effects for the countries adds robustness to the results of the analysis and therefore better enables the researcher to draw conclusions and prescribe effective action.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this study, it appears that the amount of official development assistance and expenditure dedicated to healthcare are not the most important determinants of overall health in developing nations in Sub-Saharan Africa. Rather, the prevalence of HIV, the mean years of education, and the level of corruption within a country have a much stronger impact. Following the expected flow of causation determined by the literature, policies promoting human development can stimulate long-term growth more effectively than policies regarding savings and investment (Cacares & Cacares, 2015), and better institutions can promote human development. However, providing aid with the condition of implementing better institutional policies has shown to be ineffective due to lack of accurate reporting and enforcement, and reduces a nation’s sovereignty. Given that the amount of ODA received does not have a strong correlation on health, which is one of the strongest indicators of human development, it is reasonable to shift the focus away from increasing ODA in the interest of promoting development in Africa.

Similarly to how Win & Cho compared Myanmar to more developed nations in Asia, I think further research should be done to determine why nations such as South Africa have developed faster than others within the region. Another alternative measure would be to promote international aid in other forms such as humanitarian groups, NGO’s, Food-for-Work programs, and the like. These groups bring the help directly to those that need it, bypassing the government middleman which has historically served as a gatekeeper between the two groups. The concept of microcredit created by Muhammad Yunus, which has seen remarkable success in Bangladesh, may also be applied to this region of the world as an attempt to increase the capabilities of those living in poverty. Tackling the problems from the bottom-up in this way will hopefully empower people to demand improved institutions and governance which will then lead to economic growth and overall increases in the quality of life.
**TABLE 1:**

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<th>Source:</th>
<th>Time Span:</th>
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<td>Years expected to live at time of birth</td>
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<td>Official Development Assistance (X₁)</td>
<td>Percent of Gross National Income</td>
<td>World Development Indicators (World Bank)</td>
<td>1960-2016</td>
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<tr>
<td>Health Expenditure (X₂)</td>
<td>Percent of Gross National Product</td>
<td>World Development Indicators (World Bank)</td>
<td>2000-2015</td>
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<td>Corruption (X₃)</td>
<td>Corruption Perceptions Index</td>
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<td>Mean Years of Education (X₅)</td>
<td>Percent of Population Ages 15+</td>
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TABLE 2:

![Graph of Angola's ODA vs Life Expectancy](image1.png)

TABLE 3:

![Graph of Benin's ODA vs Life Expectancy](image2.png)
TABLE 4:

<table>
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<tr>
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<th>CPI</th>
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REFERENCES


DIVIDEND HOUSING: A COMMUNITY-BASED AFFORDABLE HOUSING MODEL

Eric Malm
Cabrini University

Affordable housing programs are dominated by two large government programs - Section 8 and the Low Income Housing Tax Credit program. While these programs have private, market-based components, ultimately they are funded through largely tax dollars and are not designed specifically to help residents build financial or social capital. This paper describes the Dividend Housing Model, a privately-funded, non-profit housing model that allows residents to accumulate savings (or a 'Dividend') over time as they pay rent and participate in the operation of the community. While the model has been in existence for over a decade, this paper focuses on two enhancements - partnerships between faith-based and social service organizations; and a program-related investment funding mechanism. Together, these enhancements may help the model spread more broadly.

INTRODUCTION:

There is no end to the affordable housing crisis in America. According to a recent study by the Harvard University Joint Center for Housing Research median rents have increased by 11% between 2001-2016, while incomes fell by 2% (Richardson). And a study by the Pew Foundation found that “the share of renter households that were “severely rent burdened- spending 50% or more of monthly income on rent- increased by 42 percent between 2001 and 2015, to 17 percent.” (Pew) Clearly housing affordability and access continues to be an unresolved problem in the US. While government housing programs continue to grow, only a fraction of those who are eligible for programs can participate.

While government programs will always play a role, there is an increased focus on supporting naturally occurring affordable housing, or affordable housing that exists without government subsidy (NOAH). One such approach is the Dividend Housing Model. Conceived of in 1999, the model began with the creation of the Cornerstone Renter Equity community. The model has been extended and is now known as Dividend Housing. A Dividend Housing apartment is run as a non-profit, offers below-market rents and allows residents to accumulate ‘equity’ over time as they pay rent on time, participate in community meetings, and do assigned work tasks.

This paper describes the key aspects of Dividend Housing and then outlines two new ways that the model can be further extended - through partnerships between faith communities and local social service agencies, and by leveraging the financing potential of Program Related Investments. While these aspects are new, and not yet proven, it is hoped that these model extensions will provide an effective way for Dividend Housing to ‘scale’ in many communities across the country.

THE HISTORY OF GOVERNMENT SOLUTIONS:
Large-scale government involvement in the affordable housing problem traces back to the Great Society movement of the 1960’s. President Kennedy’s War On Poverty in the rural south eventually led the Johnson Administration’s creation of the Department of Housing and Urban Development in 1965, and the passage of the Fair Housing Act in 1968. Initially these programs led to the construction of large scale ‘projects’, often located in blighted neighborhoods that were poor to begin with. While these programs were well-intentioned, they were criticized because they tended to segregate the low income residents the programs were designed to help. And because ‘the projects’ were usually not located in economically prosperous neighborhoods, the availability of jobs (and a pathway out of poverty) were limited.

In the mid-1970’s, policy began to shift toward public support of private sector housing. With the passage of the Housing and Community Development Act of 1974, more government money started to flow through the Section 8 program. The Section 8 program was designed to encourage low income residents to be integrated into surrounding communities, rather than segregated into low-income developments. The program provides rental assistance that is paid directly to private landlords, ensuring that landlords receive timely payment, and are more likely to allow residents to live in neighborhoods with resources and jobs. Because tenant rents are scaled by their ability to pay, Section 8 helps ensure that people can both pay rent and keep food on the table.

Despite the promise, Section 8 programs have been a partial solution to the problem. According to a Frontline report, only about 1 in 4 people who are eligible for Section 8 vouchers receive the benefit, and it is widely reported that voucher recipients often fail to find qualifying housing within the designated redemption window. Currently, approximately 4.6 million families receive Section 8 or other HUD subsidy assistance (Kingsley).

An additional problem with Section 8 is that rents are limited by Fair Market Rents published by the Department of Housing and Urban Development (Housing and Urban Development). The idea of market-based rent caps is a reasonable device for providing housing in both San Francisco and rural Ohio, but the way these Fair Market Rents are calculated again effectively segregates low income housing in the poorest communities. For example, HUD calculates a single Fair Market Rent for 5 County Philadelphia region, that includes a broad range of communities. As of 2017, the fair market rent for an efficiency apartment in the Philadelphia region was $845, but there are few neighborhoods with housing available at this price. Unfortunately, Section 8 Fair Market Rents cover the market rents in only the poorest neighborhoods.

More recently, government policy has shifted toward the Low Income Housing Tax Credit program. This program, created by President Reagan and Congress in the Tax Reform Act of 1986 was designed to encourage private sector investment in the new construction, acquisition, and rehabilitation of rental housing affordable to low-income households. The idea is to provide stronger incentives for developers to profitably build housing communities that include a mix of ‘market’ and ‘affordable’ housing. Tax credit monies are channeled to states, through Community Development Block Grants, which give local control over where and how program monies are spent.

Yet the Low Income Tax Credit Program has not proven to be an adequate solution to the affordable housing crisis either. While the stock of affordable housing has increased, these developments tend not to be located in areas of economic opportunity- thus some residents face similar challenges of not being located near jobs and resources. A recent investigation by Frontline and Pro Publica (Frontline) revealed that while spending has
increased, the average construction costs are increasing even faster. Federal money is buying less housing than it used to. In addition, the reporting found fraudulent activity and inadequate monitoring of programs at the state and local level.

Despite annual federal spending of about $50 Billion, there continue to be approximately 11 million households that spend more than 50% of their income on rent (Frontline).

**FAITH-BASED, COMMUNITY AND PRIVATE SECTOR SOLUTIONS**

There are many affordable housing approaches that exist outside of the big government programs. Perhaps the best-known private sector solution to the housing affordability problem is Habitat for Humanity. Since 1976, Habitat has “helped more than 22 million people achieve strength, stability and independence through safe, decent and affordable shelter” (Habitat History). Habitat works through a network of independent affiliates that serve about 1,400 communities throughout the US.

Habitat has been successful, in part, because it provides a replicable faith-based model that empowers faith congregations and local communities to serve together to meet local needs. Despite their broad success, Habitat meets a small portion of the need. For example, the Habitat affiliate in Montgomery County PA (in suburban Philadelphia) has constructed just 63 houses over the past 28 years and has a backlog of about 50 families who have been approved for the program (Przybyłowicz). Funding is a continual limitation. While Habitat affiliates do benefit from different government financing programs, according to the most recently available 990 forms, Habitat received over 90% of its revenue from Contributions and Grants and benefitted from the volunteer efforts of about 1.4 million people. Despite this broad and sustained success, Habitat represents just a ‘drop in the bucket’.

Another category of approach is the Community Land Trust (or CLT). In a CLT, a non-profit entity buys up property in a specific neighborhood, whether contiguous or not, and signs very long term leases with others who build homes. Because the community owns the land and sets the rules of ownership and building transfer, the CLT model offers the promise of community control and perpetual affordability. For example, the Community Justice Land Trust (https://www.wcrpphila.org/cjlt) was established to provide permanently affordable housing in North Philadelphia. Initially building 36 rent-to-own townhomes in the Port Richmond section, the trust now has plans to secure property and build in two other neighborhoods. Importantly, in addition to providing permanently affordable housing, CLT’s provide a hedge against gentrification, and secure a community voice in neighborhood development.

Related to CLT’s, housing cooperatives provide another avenue for communities to secure permanently affordable housing in a particular neighborhood. In cooperative models, a member-run organization buys and manages property in a specific area. Residents buy into the coop, securing housing and building ownership. Residents play an active role in decision making. Coops are typically run by residential boards which create their own rules. (See https://coophousing.org/). For example, the LCA Cooperative (http://www.lca.coop/about.html) and Friends Housing Cooperatives (http://www.friendshousingcooperative.com/) have been providing quality affordable housing in Philadelphia for decades. While the cooperative model has proven successful and sustainable, the movement has not grown big enough to make a significant impact on the housing crisis. Again, funding is a limiting factor, since someone needs to fund the initial purchase of the property.
Within the for-profit sector, Real Estate Investment Trusts (REIT) and other
crowdsourcing platforms are allowing smaller investors to participate in affordable housing
development. REITs allow investors to participate in affordable housing initiatives without
being responsible for day-to-day management. While these efforts include many types of
development, companies such as Equity Apartments (https://www.equityapartments.com )
have created a niche by allowing households in very high-rent areas the opportunity to build
‘equity’ that can be transferred to other types of housing over times.

THE DIVIDEND HOUSING MODEL:

A relatively new approach to affordable housing was developed in 1999 by Margery
Spinney and Carol Smith. The initial Renter Equity concept was enhanced to increase
resident control, and is now known as Dividend Housing. The Dividend Housing model is
focused on permanent affordability, wealth creation, and community building. Residents in
Dividend Housing have the opportunity to accumulate Equity Credits as they pay rent on
time, participate in regular community meetings, and complete assigned work tasks. Table
1 shows some key aspects of the model. Control and shared responsibility are key
components. Unlike an apartment rental, where the landlord has primary control over
decisions, residents work with a Resident Manager to collaboratively operate the property.
In regular meetings, community members resolve issues and make operational decisions,
from what to plant in the garden, to paint colors or maintenance priorities. Community
members decide on work that needs to be done, and work responsibility is shared among the
residents.

Table 1: Key Elements of Dividend Housing

<table>
<thead>
<tr>
<th>Rent</th>
<th>Dividend Housing</th>
<th>Own</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lease</td>
<td>Ownership by the ‘commons’</td>
<td>Purchase</td>
</tr>
<tr>
<td>No control over sale or management</td>
<td>Share decision making</td>
<td>Control of sale and management</td>
</tr>
<tr>
<td>No maintenance responsibility</td>
<td>Shared maintenance responsibility</td>
<td>All maintenance responsibility</td>
</tr>
<tr>
<td>No savings</td>
<td>Equity Credits</td>
<td>Home equity</td>
</tr>
</tbody>
</table>

Source: Spinney 2019

Residents in Dividend Housing make a long-term commitment to living in the
community. Turnover and vacancies are costly. Dividend Housing residents benefit
financially from their long-term commitments to the community, accumulate Equity Credits
that can be translated into cash after a multi-year vesting period. Dividend Housing
communities are intended to be long-term, permanently-affordable homes. Unlike rental
properties that may be ‘flipped’ as a neighborhood gentrifies, the idea here is for residents to
have a stake in the long term success of a neighborhood.

The model includes three key documents- a Renter’s Agreement, Resident Association
Agreement and House Rules. The Resident Association Agreement and House Rules are
similar in concept to those governing a housing cooperative. In the Co-Op context, a resident
association agreement creates the formal context for the community. Residents work together
to create the rules that govern life in the community. As each community is different, rules
and structures will vary to reflect the goals of those living in the community. The Renter’s Agreement, however, is different than in a Co-Op. Here, the Renter’s Agreement includes a schedule describing how Equity Credits are accumulated, when they vest, and how they can be used.

The first community that was founded using these principles and structures was the Cornerstone Equity community in Cincinnati, Ohio. According to a study of the Cornerstone community prepared for the Ohio Housing Finance Agency, “although residents expressed appreciation for the opportunity to build equity, survey respondents indicated that what they valued most about Cornerstone was the opportunity to live at an affordable, safe, attractive and convenient property; the support of a close community; a responsive property manager; and a voice in decisions affecting their homes.” (Drever)

At the time of the evaluation report, just 14% of people left the community prior to the 5-year vesting requirement. Those who departed after vesting had accumulated an average of $3497 in equity; those who have vested and were still living at Cornerstone had an average equity of $2600. (page 26) While survey respondents reported the aspirational goals of using accumulated equity to buy a house or car, in practice residents more often used equity to pay medical or other bills.

An additional aspect of the Cornerstone program was the ability of residents to borrow money to cover short term expenses. Over a ten-year period, 53% of Cornerstone residents took out between one and three loans, often to cover rent or to pay for a car repair and 78% reported that the availability of the loans contributed to their sense of financial security (p. 27). The loan program provided an important alternative to payday loans.

While the Dividend Housing model has been successful for residents and the surrounding community, the model has been slow to scale. The current model relies upon initial external funding to purchase and renovate the buildings. In the case of Cornerstone, the initial funding of the property came from several sources. In the case of the Renting Partnerships community in Avondale, the building was made available through a master lease agreement for a building owned by a community organization. Grant funding has been sought to purchase other sites, but this funding is difficult to obtain. In order for the model to grow, more scalable solutions must be found.

**MODEL EXTENSIONS: FAITH BASED SOCIAL SERVICE PARTNERSHIPS AND PROGRAM RELATED INVESTMENTS**

In this section we explore two potential ways to extend the model, 1) by leveraging existing partnerships between faith-based institutions and social service agencies, and 2) by seeking long term loans from social investors using the program-related investment model. It is hoped that these model extensions will provide additional ways to expand the impact of Dividend Housing.

In 2017, members of a small (Quaker) faith congregation, Norristown Friends Meeting, began exploring possible ways to address the affordable housing issue in their immediate community. The median income in Norristown is $41,856, compared to a county average of $80,675. Yet median rents in Norristown are $1,011, compared to the county average of $1,158. Members of the Meeting community began to explore alternative solutions, including cooperative models.

In conversation with neighbors, they discovered that a Mennonite couple had been quietly operating an affordable housing building, called Swede Street Home Apartments, for
over 20 years. While the building was originally established to provide affordable housing for people re-entering the community from prison, it now serves a broader mix of residents. The owners offer below market rents, allowing people to live affordability and save for the future.

They also met with the Executive Director of a local social service agency, a domestic violence agency, that was located on their street. The Executive Director spoke of the difficulty they faced securing safe, affordable housing for the women going through their program. She even suggested that a county program that provided short term housing subsidies was having the adverse effect of placing upward pressure on rents. To their surprise, the church members also learned that the non-profit owned a home directly across the street from the church that would likely be for sale in the near future.

While talking with members of their broader church community, it was discovered that a senior housing fund operated (managed by a Quaker group) had a healthy endowment, and had previously operated a boarding home for seniors in the community. Conversations began about partnering with the senior housing committee, and the possibility of securing funding from the endowed fund.

Simultaneously they became aware of a relatively new investment option for social investors. Program-related Investments (or PRIs) are a relatively new vehicle that allow foundations to make below market loans to non-profit organizations that are aligned with the mission of the foundation. Organizations like the McArthur Foundation are promoting the use of PRI’s to expand impact (Chernoff). Private Foundations are required to spend 5% of income on charitable purposes; PRI’s allow foundations to credit the difference between market and non-market returns as charitable spending provided that loans are made to non-profit organizations to fund activities that are consistent with the foundation’s mission.

While not all potential funders will need to meet the same IRS requirements as private foundations, the framework of PRI’s is likely to appeal more broadly to social investors. By loaning (not giving) money to a non-profit, supporting an important social mission and backed by the value of real estate, the PRI framework provides a promising structure for future financing. Currently the Norristown group is seeking funding from Social Investors to purchase and run a non-profit apartment building.

The intention is to run the building using the Dividend Housing model. But the partnership between the faith community and the social service non-profit provides several potential enhancements to the model. First, it is anticipated that a significant amount of funding will come from individuals and organizations involved in the partnership. This funding may come from organization endowments, or from individuals with a connection to the local community. Second, the intention is to seek housing referrals from the social service nonprofit and senior housing committee. It is hoped that these referrals will help to identify people who are well-suited to living in a shared-living environment. It is also hoped that the partnership will help continue the personal support that both organizations provide. Third, it is expected that members of the church and social service communities will contribute social capital as well, helping support the people and mission of both organizations.

CREATING A MODEL FOR GROWTH:

Dividend Housing has been shown to provide a viable and valuable solution to the affordable housing solution in local communities. It is hoped that by leveraging partnerships
between faith communities and local social service non-profits, that the model will be able to grow more broadly. Every church community supports various organizations in their local community. Whether it’s Habitat for Humanity, senior services organizations, prison re-entry, or programs for women and children, nearly every faith congregation has close ties to community needs. Every church community also has resources- financial, social and spiritual. By providing a model that leverages these resources, it is hoped that the Dividend Housing model will be able to grow more broadly

Figure 1: Conceptual Framework

Previous efforts to ‘scale’ Dividend Housing have centered around a traditional property management model. A growing set of managed properties can fund a paid staff, allow for shared maintenance and management resources, provide a sustainable channel for promotion and vetting of potential residents, and has the potential to significantly transform communities. But the property management model is also capital intensive, and relies on scale to fund the underlying structure and staff.

The partnership approach between faith congregations and local social service agencies provides an alternative path to growth. Rather than growing the number of properties under management, the focus becomes sharing the model among many faith communities in many areas. Rather than seeking grant or other funding from outside agencies, the model leverages potential funding sources that exist within the local community. And rather than recreating property management structures, the model supports and extends current efforts of faith and social service organizations.

Dividend Housing represents a model with great potential for addressing housing affordability, while growing community and positively impacting the lives of people. It is hoped that extending the concept by creating a blue-print that local faith communities and social service agencies can follow will help magnify the impact of Dividend Housing over time.

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DOES THE FRIEDMAN-HAYEK HYPOTHESIS APPLY TO THE INTERNET?

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ABSTRACT

The Hayek-Friedman hypothesis suggests that economic freedom is a precondition for political freedom or democracy. We test a variation of this hypothesis by exploring the relationship between Freedom House’s index of Freedom on the Net to the Fraser Institute’s Economic Freedom of the World Index. Although not a direct measure of democracy, freedom on the internet is an important component for a democratic society, and highly related to political freedom scores. We find few instances of countries exhibiting relatively high internet freedom without relatively high economic freedom.

INTRODUCTION

Friedrich A. Hayek (1944), writing during a time when political liberalism in its proper sense was falling apart in Europe, warned socialists of all parties on the continent and abroad of the socialism’s negative effect on political freedom, writing: “The French writers who laid the foundations of modern socialism had no doubt that their ideas could be put into practice only by strong dictatorial government.”

His fear was that the central planning of Great Britain, where The Road to Serfdom was written and first published, even if achieved democratically rather than violently as in the approach taken by Germany, would threaten Western European values and human freedoms across the world. These thoughts are echoed nearly 20 years later in Milton Friedman’s book Capitalism and Freedom, where Friedman argued that capitalism was a necessary but not sufficient condition for political freedom and democracy generally (Friedman 1962). In this book he states “democratic socialism… is a delusion…only certain combinations of political and economic arrangements are possible…a society which is socialist cannot also be democratic, in the sense of guaranteeing individual freedom.”

These thoughts came to be known as the Hayek-Friedman hypothesis, where political freedom is stable only in an environment of economic freedom. Lawson and Clark (2010) and Khan (2012) test this hypothesis and find support for it. Cases where high political freedom is observed within a country without economic freedom are rare and decreasing through time. Milton Friedman’s views on political freedom extended beyond formal political voting rights and included a broader array of freedoms such as civil freedom. According to Lawson and Clark (2010) there is very little to be gained in treating political freedom separately from civil freedom as they are both highly correlated and representative
of democratic freedoms broadly. Bjørnskov (2018) for example tests the Hayek-Friedman hypothesis with respect to freedom of the press, a necessary component of any liberal democracy, and finds that improvements in economic freedom are often followed by increases in freedom of the press.

The purpose of this paper is to extend the analysis of the potential array of democratic freedoms incubated by economic freedom to include freedom of the internet. Using data from Freedom House, we test whether the Hayek-Friedman hypothesis holds true for internet freedom. In other words, can a country have a high degree of internet freedom without economic freedom? The matrix in Figure 1 is a visual of four possibilities for countries’ economic and internet freedom combinations, only one of which violates the Hayek-Friedman hypothesis. The top right quadrant is a case of high internet and economic freedom, and the bottom left is a case of low internet and economic freedom. If these two freedoms are highly related, we would expect that most country observations would occur in these two quadrants. The bottom right quadrant is a case of high economic freedom with low internet freedom. If economic freedom is a prerequisite for internet freedom, it does not follow that countries with high economic freedom must have high internet freedom, so this quadrant would also not be a violation of the Hayek-Friedman hypothesis. The top left quadrant however is a case where the Hayek-Friedman hypothesis is violated, in that a country would have high internet freedom without the environment of high economic freedom. If economic freedom is a necessary condition for other democratic freedoms, we would not expect cases of this.

In what follows we describe internet freedom, the data and methodology to be used, discuss our findings, explore individual country case studies, and provide concluding thoughts. Our findings largely support the Hayek-Friedman hypothesis, or that observations of countries with high internet freedom without high economic freedom are rare and decreasing through time.

INTERNET FREEDOM

As we move forward through the age of technology, the role of the internet becomes more and more apparent. It is becoming increasingly obvious that a technology that was barely commercially available 30 years ago has become a human right. Lack of access to the internet no longer means that a person can’t play online games or view cat videos. Instead, the lack of access to the internet can mean that people are cutoff from the news, job opportunities, and even warnings in emergency situations. Fortunately, the world is becoming increasingly connected to the internet. As of April 2019, 56.1% of the world’s population has access to the internet, including 81% of the developed world (International Telecommunications Union, 2019). This is a rapid increase from the 23% worldwide access only ten years ago. During that time, access to the internet in the developing world increases from 14% to 41%.

This paper, however, is not concerned with global access to the internet as world connectedness is an eventuality. Instead, this paper focuses on how that access to the internet is shaped. Because of the way commercial internet functions, there are a variety of opportunities for government to access, restrict, or block user content. As technology has improved, a variety of methods have appeared that allow for some circumvention; however, this is typically reserved for those on the cutting edge. That same technology has also allowed governments and companies to peek into the lives of everyday people. In George Orwell’s
1984, the telescreen was a coercive measure forced upon its citizens to allow the government to spy on its citizens. Surely Orwell would be shocked to discover our use of the smartphone (and other smart gear, appliances, etc.) and to find that we have accepted the telescreen in our everyday lives…and even pay for the opportunity to have one!

The role of the government with respect to internet access has become a hot topic throughout the world. In fact, some people claim that the future of democracy is directly tied to the rights that citizens have when it comes to the ability to freely access unaltered internet content. But, in this era of “fake news,” governments are realizing an opportunity to curate and regulate content “for the good of the people.” In the United States, the first amendment of the US Constitution guarantees the freedom of the press. But, is a blogger considered to be a member of the press? Do the same rights transfer to a conspiracy theorist? At what point can content be seen as a threat and no longer covered by the first amendment? This very question is being argued in court systems around the world as governments attempts to obtain powers in this area.

For instance, at least 17 countries in the past year have either proposed legislation or passed legislation that would restrict online media. At the same time, at least 18 countries have increased surveillance on its citizens (Freedom House, 2018). In fact, according to the Freedom House Freedom on the Net report, nearly half of the countries tracked saw a decline in internet freedom in the last year.

Even more shocking is that China, known internationally for its complete control over its citizens’ internet access, has hosted training sessions with dozens of countries to teach them how to design similar information management systems. This shows that the future of the internet in many countries is not freer. Instead, it is likely there will be a race between citizens that demand economic freedom and the governments that want to harness as much power as possible.

DATA

In this section the data to be used is described, informally analyzed, and following Lawson and Clark (2010) an observational test of the Hayek-Friedman hypothesis is performed. Three different types of freedom data are included in this study, being internet freedom, economic freedom, and political freedom. The focus of the paper however is on internet freedom and its relation to economic freedom. The specifics of each variable are discussed in detail below.

Internet Freedom

Freedom House describes the internet as “a crucial medium not just for personal communication or news and information, but for political participation and civic engagement. The struggle for internet freedom in consequently inseparable from the struggle for freedom of every kind.” (Freedom House 2018)

It is Freedom House’s freedom on the net index that we use in this study to measure internet freedom. Freedom House grades a country in three categories: obstacles to access, limits on content, and violations of user rights. This index was started in 2009, and continued in 2011 through 2017, covering 65 countries other than 2009 when only 15 countries were covered. The total internet freedom score is out of 100 points with each category scored separately. The weight of each category is discussed below. In total, the lower the score, the
more free citizens are to use the internet. For the purpose of this paper, we adjust the scoring system to match the economic freedom index in the study. The adjusted internet freedom score is from 0 to 10, 10 being the highest level of internet freedom.

First, a country earns a score out of 25 based on the obstacles its citizens face to secure access to the internet. According to the Freedom House report, the obstacles to entry score “assesses infrastructural and economic barriers to access; government efforts to block specific applications or technologies; and legal, regulatory, and ownership control over internet and mobile phone access providers.” For example, a country is rated as being ‘less free’ if they block websites like Wikipedia or Facebook or even applications such as WhatsApp. For example, due to the political turmoil caused by rapidly rising fuel prices in Zimbabwe, the government recently decided to block Facebook, WhatsApp, and Twitter. This is not the first time Zimbabwe has blocked internet communication of its citizens. Another component of the access score considers how a citizen’s socioeconomic status affects their ability to access the internet. For example, the nation of Somalia has an internet penetration rate of only 1.88%. On the other hand, Iceland has an internet penetration rate of 98.24%. The economic ability to access the internet plays a major factor in a country’s internet freedom.

The second category used to score internet freedom is limits on content. This category is scored out of 35. According to the Freedom House report, the limits on content score “analyzes legal regulations on content, technical filtering and blocking of websites, self-censorship, the vibrancy and diversity of online news media, and the use of digital tools for civic mobilization.” The classic example of limit content is China’s “Great Firewall” which blocks users from accessing information critical of the country’s leadership. Another component of this category determines whether journalists have freedom to report online. For example, do journalists need to “self-censor” in order to avoid possible punishment? Are there a variety of robust sources available for news in the country or does everything return to the state-run news? In total, this category is meant to measure the citizens’ ability to access independent and unbiased information from the country and from the world.

The third and final category measures violations of user rights and is scored out of 40. According to the Freedom House report, violations of user rights “tackles surveillance, privacy, and repercussions for online speech and activities, such as imprisonment, extralegal harassment, or cyberattacks.” For example, are there laws which protect a citizen’s internet freedom and the ability of citizens to be punished and imprisoned if they attempt to safeguard their internet freedom through methods such as encryption and the use of VPN. Further, the category also addresses the amount of information internet service providers are expected to provide to government authorities and the degree to which the internet in a country is susceptible to cyber-attacks.

Economic Freedom

The second freedom index used in this study is the Economic Freedom of the World Index compiled by the Fraser Institute (Gwartney et al. (2018)). This index is created by scoring five different categories: size of government, legal structure and property rights, sound money, freedom to trade internationally, and regulation. These five categories are scored out of 10 and then averaged together for an overall economic freedom score out of 10. The closer a score is to 10, the more economic freedom the citizens of the country have.
The first category is the size of government. The components that factor into this category’s ranking include the amount of government consumption, the degree of transfers and subsidies, the extent to which the government is involved in the business world, and the top marginal tax rate.

The second category is the legal system and property rights. The components of this category include how independent and impartial the courts tend to be along with their integrity, how protected property rights are, the degree to which the military is involved in everyday life, the strength of contracts, the regulatory costs of the sale of real estate, the reliability of police, and the total business costs of crime in the country.

The third category measures the soundness of the monetary system of the country. This includes the rate of money growth, the inflation rate, and whether it is legal to own foreign currency bank accounts. The fourth category is the freedom to trade internationally. This category includes the size of tariffs instituted by the country, the regulatory trade barriers imposed by the country, the black market exchange rates, and the restrictions placed on foreign citizens on visiting the country in addition to investing in a nation’s capital. The fifth and final category is regulation. While this is a wide-ranging category, the main components include the degree of regulation in the credit market, the regulation in the labor market, and the overall amount of regulations faced by businesses.

The goal of the economic freedom index is to measure how free a citizen or business is to participate in a nation’s economy. As mentioned above, this also pertains to the number of hurdles that must be cleared in order to participate in the economy in addition to the amount of interference caused by the government.

Political Freedom

The third and final freedom index is Freedom House’s Freedom of the World Index (Freedom House 2018). While the total score is comprised of components of both political and civil liberties, we only use the political freedom score as civil liberties are included in the other indices.

As was the case with internet freedom, a variety of categories are used to rate political freedom on a scale of 1 to 7 with a score of 1 representing a country which is most free. As will be discussed later, this index will be recalculated to align with the economic freedom of the world index.

A total of three categories are considered in the calculation of the political freedom score. The first is measures the freedom and transparency of the electoral process. This category measures whether the president and legislature is elected through a free and fair electoral process and whether that process is fair and implemented impartially. The second category is concerned with political pluralism and participation. This category considers the freedom citizens have to participate in the electoral process. This can include whether people have the right to organize in more than one political party, whether an opposition party has a realistic opportunity to gain power through an election, whether the military, foreign powers, religious groups, or economic superiors have control over the electoral process, and whether minority groups, such as ethnic, religious of LGBT groups have full political rights.

The third and final category used in the computation of the political freedom index is the functioning of the government. This category considers whether elected officials are the ones that create legislation, whether safeguards exist against corruption, and whether the government operates with openness and transparency.
Alignment of the Data

In order to make the data comparable, we adjust the scoring system so that a higher score represents a greater degree of freedom. There was no adjustment needed for the economic freedom data. For the internet freedom index, we inverted the score so that a score of 100 would correspond to the highest level of internet freedom (compared with the previous scale where 1 corresponded to the highest level of internet freedom.) Additionally, we converted the score to be out of 10 rather than 100. Finally, the political freedom index was inverted so that a score of 7 corresponds to the highest level of political freedom.

Because each index uses a different numbering system, and to better determine what constitutes a high level of internet freedom, we standardized each value according to the mean and standard deviation of the given index. This allows us to compare how free a country is in each category relative to the average level of freedom in the world. The more positive standard deviations from the mean correspond with more freedom while the more negative standard deviations from the mean corresponds with less freedom.

QUANTITATIVE ANALYSES

Correlation between Indices

Table 1 is a matrix showing the correlation coefficients between each of the variables in addition to the significance level of the correlation coefficient. As one can see, internet freedom is highly correlated to political freedom, and is a likely representation of democratic liberal values much like freedom of the press.

Figures 2-4 are scatter plots that detail the relationships between the freedom indices in this paper. Figure 2 depicts the more classic comparison of political and economic freedom. Countries with relatively high political freedom (higher up on the y axis) and with relatively low economic freedom (further left on the x axis) would potentially violate the Hayek-Friedman hypothesis. Figure 3 shows the strong and positive correlation between political and internet freedom, indicating that internet freedom is a proxy for democratic freedoms. Figure 4 illustrates the relationship between internet and economic freedom. Similar to Figure 2, observations towards the top left of the graph are potential violations of this adapted Hayek-Friedman hypothesis, and would represent country observations with relatively high internet freedom without the expected requirement of an environment of economic freedom.

A Simple OLS Regression

In order to test for the significance of these relationships, and to find preliminary evidence for the determinants of internet freedom, a simple ordinary least squares regression was run, provided below in Table 2. Internet freedom was treated as the dependent variable and economic and political freedom as the independent variables. These freedoms are highly related in a positive and statistically significant fashion. Countries with higher levels of economic freedom experience higher internet freedom, more specifically a 1 standard deviation increase in economic freedom leads to a 0.159 standard deviation increase in internet freedom.
A Visual Representation

Additional evidence for this relationship is provided by an observational heat map comparing various combinations of internet and economic freedom levels in Table 3. The table shows the number of observations between two values in increments of 0.5. The value listed in each row and column is the upper-bound. For example, if the value in the internet freedom column is 0.5 and the economic freedom row is -1.0, then the value listed are the number of observations where the internet freedom is between 0.5 and 1 the economic freedom is between -1.0 and -1.

Following Lawson and Clark (2010) who were in turn inferring from statements in Friedman (1962), we will consider relatively high internet freedom to be above 1 standard deviation from the mean, and relatively low economic freedom to be below 0.5 standard deviations from the mean. Friedman (1962) stated that it was unlikely for a country to be “marked by a large measure of political freedom” without “something comparable to a free market.” Although the exact cutoffs are somewhat arbitrary, 1 standard deviation from the mean is a reasonable difference to be considered a “large measure.” For the 300 total observations comprised of 61 countries over 7 years, only 11 of the observations (3.7%) violate the Hayek-Friedman hypothesis representing 6 distinct countries over 6 years. These numbers are highlighted in red. As shown in Table 4, these observations are decreasing through time as the only country to violate the Friedman-Hayek hypothesis in 2016 is Iceland. Other countries did violate the hypothesis but moved to another quadrant. For example, France violated the hypothesis in 2013 but saw an increase in economic freedom in later years. On the other hand, Italy left the violation zone due to a decrease in both economic and internet freedom. The solid black lines in Table 3 highlight the quadrant cutoff lines as a reference point for the reader to consider, and correspond to the quadrants in Figure 1. It should be noted that 10 of the observations that violate the Hayek-Friedman hypothesis still had above average economic freedom, but due to the chosen cutoff were in the top left quadrant. Only one observation had below average economic freedom with above average internet freedom, being South Africa in 2009.

The exact countries that have an internet freedom level of greater than 1 standard deviation from the mean, an economic freedom level less than 0.5 standard deviations from the mean, and countries that meet both criteria are listed in Table 4 in columns 1, 2, and 3 respectively.

COUNTRY CASE STUDIES

Below, we discuss five countries and the recent trends in both economic and internet freedom. One thing to keep in mind is that internet and economic freedom are still given as standardized scores, so a change in the world average could cause a change to a country’s standardized score even if their actual freedom score did not change. Below are the annual averages of each variable. Recall, the economic freedom index is rated out of 10 (with 10 being most free.) The internet freedom was originally scored out of 100 with 0 being most free. But, to align the data, we reversed the scale and compressed the index to align with the economic freedom index. So now the internet freedom index is scored out of 10 with 10 being the freest. The political freedom score is rated out of 7 with a score of 7 indicating the greatest political freedoms. As mentioned earlier, there was not an index created for every year. It can be seen in Figure 5 that the averages have not changed much over the past eight
years other than a large increase in political freedoms from 2015 to 2016. Therefore, an increase in the standardized freedom score will also represent an increase in absolute freedom level as well.

*United States*

We start by looking at the United States. As it currently stands, the United States currently ranks number six in the world in internet freedom though they did rank number 5 in 2017. While the level of internet freedom has fallen in the past several years, its standardized score has increased meaning that internet freedom in the United States, while falling, is not decreasing as quickly as the world average. This is shown in Figure 6.

The main driving force behind the decreases in internet freedom is the rollback of net neutrality and the flood of “fake news” created by foreign bots which was seen during the most recent election cycles. Even though sites like Reddit and Facebook are attempting to reduce the number of bots, there is still serious concern over the impact foreign governments can have on the thoughts of American citizens. In addition, many major companies, including the credit reporting agency Experian, were hacked and experienced major data breaches. On the other hand, some surveillance methods were discontinued. For example, information on American citizens was collected during the surveillance of foreign targets. This type of surveillance, known as “about surveillance” is no longer used.

*China*

Over the past several years, the level of economic freedom has decreased even though its internet freedom has increased, at least in relation to the rest of the world. Even though the level of internet freedom has increased, China is still the least free nation when it comes to internet freedom. Known for its “Great Firewall,” China has been historically known for its restrictions on both creation and access to a variety of internet services. Even though 53.2% of its population uses the internet, China has employed a variety of methods the reduce internet freedoms. This is shown in Figure 7.

For example, China has strict rules against anonymity online. In November of 2016, new laws were passed which required Chinese web users to register their real names and store all of their information within mainland China. In addition, there is mounting evidence of censorship within online chat programs as well as jail time for those discussing anti-Chinese sentiments. Finally, a 2017 law prohibits the use of Virtual Private Networks (VPNs) which allow users to mask their identity.

Chinese citizens also have serious issues with how they obtain their news. Chinese law limits the ability of individuals to post news online. This means that Chinese citizens are required to get their news from state-run media even online. Any organization that wants to post news must obtain licenses from the Chinese government.

*Tunisia*

Tunisia is an interesting case because of the reforms that have occurred over the past decade. Tunisia was the first domino to fall during the Arab Spring which occurred from 2010 to 2012. This led to the overthrow of the Tunisian government and its first free election in 2014. While economic freedom fell during the protests, improvements can be seen starting
in 2013, though some economic freedom has been lost. At the same time, there have been improvements to internet freedom. In 2009, Tunisia was one of the least free countries whereas today they are the most-free country in the Middle East and Northern Africa. This is shown in Figure 8.

Part of this growth in internet freedom has come through increased access to the internet which was fueled by mobile subscriptions. While there is a semi-monopoly on internet access in Tunisia, it has not stopped widespread access. The growth in internet penetration is shown below.

Other sources of the growth in internet freedom come from New legislation from the recently elected parliament. These anti-corruption laws are meant to allow free speech against the government though there are doubts about the long-term success of the legislation.

Turkey

While Tunisia gains internet freedom, Turkey is heading in the other direction. Since 2009, the level of internet freedom in Turkey has fallen. Much of this is associated with the increased power appropriated by President Recep Tayyip Erdoğan. There have been many instances over the past several years where internet access and communication has been cutoff during periods of unrest. This includes during the 2016 political coup which attempted to oust President Erdoğan. In addition, tens of thousands of people have been imprisoned due to their suspected involvement in the coup or their posting of information in support of the coup. This is shown in Figure 9.

According to the Freedom House report, Turkey accounted for 65% of all local Twitter content removals. In addition, Turkey has blocked access to Wikipedia due to the content on Turkey’s involvement in both the Armenian Genocide and the Syrian Civil War.

Estonia

The final country to be discussed is Estonia. Often seen as a model of economic freedom, Estonia’s commitment to internet freedom is on the same level. Per the 2017 rankings, Estonia is ranked second in internet freedom just behind Iceland. Estonia considers itself as an “e-state.” Part of this designation includes the country’s commitment to making as many government services available to its citizens online. For instance, citizens are able to vote, open a business, access medical records, and use a digital ID for identification. In addition, Estonia has shown a strong commitment to data security. In Estonia, citizens not only own their medical records, but they also have the ability to see what data is stored and used by the government. In an era of increasing reliance on the internet, Estonia may very well be a model the rest of the world can use. This is shown in Figure 10.

FUTURE WORK

There are a variety of modifications that will be made in the future. First, a more rigorous empirical analysis will be performed. This includes causality testing to identify the direction of the relationships between internet freedom and economic freedom and internet freedom and political freedom.
Second, one drawback of the current use of the internet freedom index score is that the first category is influenced by internet penetration. As mentioned earlier, this paper is not concerned with internet penetration and is instead interested in focusing on the role government plays with respect to internet control over the internet. Unfortunately, the first category also measures the government’s blocking of internet applications which makes it impossible to completely disregard the category altogether. Therefore, we will explore each category individually to determine how each component of internet freedom is related to economic freedom.

CONCLUSION

Over half a century ago Friedrich Hayek and Milton Friedman both predicted that economic freedom was not only related to democratic freedoms, but that economic freedom was a prerequisite for democracy itself. Modern economists have largely confirmed this hypothesis (Lawson and Clark 2010). This paper extends the literature by analyzing a specific democratic freedom not yet explored in this context, being freedom of the internet. Internet freedom is a critical component in a modern democracy and would likely have been considered as such by Hayek and Friedman. Evidence from this paper suggests that internet freedom does behave like a political freedom in that it is highly correlated to political freedom and seems to only exist in an environment of economic freedom, supporting the Hayek-Friedman hypothesis. Observations of countries with a relatively high level of internet freedom without a good measure of economic freedom are rare and decreasing through time. Although not necessarily impossible, it seems that this situation is unstable and unlikely. Economic freedom therefore is a prerequisite freedom for internet freedom, and freedoms broadly as seen in Lawson and Clark (2010), Bjørnskov (2018), and Khan (2012).

REFERENCES


Figure 1: Economic and internet possibilities matrix

<table>
<thead>
<tr>
<th>High internet freedom</th>
<th>Not economically free</th>
<th>Economically free</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violates Hayek-Friedman hypothesis</td>
<td>Estonia, USA, UK</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Low internet freedom</th>
<th>Not economically free</th>
<th>Economically free</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venezuela, Iran</td>
<td>Bahrain</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Economic freedom versus political freedom, 2009 - 2016
Figure 3: Internet freedom versus political freedom, 2009 - 2016

Figure 4: Internet freedom versus economic freedom, 2009 - 2016
Figure 5: Average Internet, Economic, and Political Freedom

![Average Internet, Economic, and Political Freedom Graph](image)

Figure 6: United States Internet and Economic Freedom

![United States Internet and Economic Freedom Graph](image)
Figure 7: China Internet and Economic Freedom

Figure 8: Tunisia Internet and Economic Freedom
Figure 9: Turkey Internet and Economic Freedom

Figure 10: Estonia Internet and Economic Freedom
Table 1: Correlation matrix of economic, internet, and political freedom

<table>
<thead>
<tr>
<th></th>
<th>Internet Freedom</th>
<th>Economic Freedom</th>
<th>Political Freedom</th>
</tr>
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<tbody>
<tr>
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</tr>
<tr>
<td>Economic Freedom</td>
<td>0.445***</td>
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</tr>
<tr>
<td>Political Freedom</td>
<td>0.803***</td>
<td>0.535***</td>
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</tbody>
</table>

Note: *** =1%, **=5%, *=10% significance level

Table 2: OLS Regression of Internet Freedom

<table>
<thead>
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<th>Variable</th>
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<th>(2)</th>
<th>(3)</th>
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</thead>
<tbody>
<tr>
<td>Economic Freedom</td>
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<td></td>
<td>0.159***</td>
</tr>
<tr>
<td>(standard deviations)</td>
<td>(0.048)</td>
<td></td>
<td>(0.033)</td>
</tr>
<tr>
<td>Political Freedom</td>
<td></td>
<td>0.808***</td>
<td>0.760***</td>
</tr>
<tr>
<td>(standard deviations)</td>
<td></td>
<td>(0.031)</td>
<td>(0.036)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.110***</td>
<td>0.300***</td>
<td>0.301***</td>
</tr>
<tr>
<td>(standard deviations)</td>
<td>(0.052)</td>
<td>(0.032)</td>
<td>(0.034)</td>
</tr>
</tbody>
</table>

Observations | 300 | 385 | 300
R-squared     | 0.196 | 0.645 | 0.681
F-statistic   | 73.68*** | 696.46*** | 316.77***

Dependent Variable: Number of standard deviations away from average internet freedom

Standard errors in parentheses: *** =1%, **=5%, *=10% significance level
### Table 3: Heat map of economic versus internet freedom (2009-2016)

<table>
<thead>
<tr>
<th>Economic Freedom Greater Than: (increments of 0.5)</th>
<th>-3.5</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
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<th>0.5</th>
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<tr>
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<td>0</td>
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<td>0</td>
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</tr>
<tr>
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<td>0</td>
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<td>0</td>
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</tr>
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Table 4: Countries with high levels of internet freedom without high levels of economic freedom

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<tr>
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<td>Colombia 2014-2016</td>
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<td>Japan 2013-2016</td>
<td>Ecuador 2013-2016</td>
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<tr>
<td>South Africa 2009</td>
<td>Ethiopia 2014-2016</td>
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<tr>
<td>United Kingdom 2013-2016</td>
<td>France 2013, 2016</td>
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<td></td>
<td>Iceland 2013-2016</td>
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<td>India 2009, 2011-2016</td>
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<td>Italy 2011-2016</td>
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<td></td>
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<td></td>
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<td>Russia</td>
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<td>Zambia</td>
<td>2014-2016</td>
<td></td>
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<tr>
<td>Zimbabwe</td>
<td>2011-2016</td>
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FROM GOWN TO TOWN: THE ECONOMIC TRANSFORMATION OF THE UNIVERSITY OF PENNSYLVANIA

Helen M. Midouhas
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ABSTRACT

Dr. Judith Rodin has the distinction of being the first female to hold the office of president at an Ivy League university. During her presidency she revitalized the blighted neighborhood the University calls home via the solutions she implemented to address economic issues. These accomplishments gave legitimacy to her presidency. This paper will explore how the West Philadelphia Initiative allowed Dr. Rodin to 1) gain legitimacy as a new president in a traditional university structure; 2) employ solid economic strategies that promoted change, hence enhancing her legitimacy; and 3) engender a legitimate succession for the next president of the university.

INTRODUCTION

Nestled in West Philadelphia sits one of the oldest Ivy League universities in the nation. Established in 1751, the University of Pennsylvania, in an effort to endorse the German university model of combining teaching and research, expanded its campus to the western farms outside of the young city of Philadelphia (Rodin, 2007). Accessible given the building of bridges to gain access across the Schuylkill River, the university established itself in Western Philadelphia in an effort to find space for the growth of schools and research institutions. This growth mirrors Penn’s mission statement, which is based on its founder, Benjamin Franklin’s, vision of pushing the “frontiers of knowledge” (“About Penn,” 2014). The physical outcome of this was a gown and town situation that covered over 302 acres, with 219 buildings, 141 research centers, and an endowment for 2014 of $9.58 billion (“Facts,” 2014). The phrase town and gown refers to the dichotomous relationship between a university and its surrounding area (Barber & Lindsay, 2007; Perry, 2010; Rodin, 2007; Valick et al., 2012). The university was in a position to make policies and decisions that either improved the quality of life for its residents or alienated its residents and keep all resources contained within the campus walls. The university and similar institutions are often seen as the key to economic stability and reputation for an area or city (Valick et al., 2012). According to Barber and Lindsay (2007), this precarious relationship is tested when the gown attempts to increase a presence in the town, or neighborhood. In the two decades that followed the 1980s, the University of Pennsylvania had the image of the beast, taking and not giving to the town it devoured with its rapid expansion. It is noteworthy that Penn’s current mission statement purports an inclusivity of the institution within the community (“About Penn,” 2014).
Meanwhile, the area of West Philadelphia had succumbed to urban decay; as suburbia grew, professionals migrated out of the area along with their companies and the retail, services, and tax base that supported them. This left a hole that was eventually filled with the blight seen in America’s inner cities; high poverty, uninhabitable housing, empty store fronts, trash and glass littered streets, and green spaces that housed drug dealers, addicts, paraphernalia, and prostitution. The year 1994 had two critical incidents that would change this.

PRESIDENCY OF DR. RODIN

In 1994, a Penn graduate student was shot to death over pocket money during a robbery. This event, while one of many that had occurred over the preceding decades, seemed to spark mobilization by both the community and university. This was partially fueled by the first female president for the university, as well as the first female Ivy League president, Dr. Judith Rodin’s election earlier that year. Dr. Rodin, a native of Philadelphia and Penn alumna, was taxed with running a man’s university and clearly recognized her challenges. She had served as the provost of Yale from 1972 to her election at Penn in 1994. At Yale, she worked diligently to change a male dominated culture that did not see women as serious about academic roles. Mentoring women to be risk takers and see challenges as opportunities, Dr. Rodin worked hard not to “pull the ladder up behind me for other women” (Kolesnikov-Jessop, 2014, para. 2). Her challenge at Penn would not only be to penetrate what Bornstein (2009) describes as gender stereotype impediment, but to establish legitimacy in a university that did not have any precedent of female leadership. Dr. Rodin ultimately formed a presidency that achieved a fit of institutional culture while complimenting its mission of problem solving through discovery (“About Penn,” 2014).

COLLABORATION AND COHESION

Dr. Rodin described this discovery as an iterative process (Kolsnikov-Jessop, 2014). Using the talents of others, she led her coalitions and focus groups to perform small analyses that would bring about results, and take the next step depending on the outcome of that discovery. The iterative process traditionally looks at building up to the goal or outcomes, often through planning, design, testing, revising, and retesting until the plan results in the desired outcome (Lee, Steven, & Timothy, 2011). Central to this process was the management of individuals and teams from a variety of departments and with mixed educational credentials. Post (2013), who studied 82 mixed gender led teams in 29 organizations, found that women excel at leading teams that are, “functionally diverse, larger, or geographically dispersed (p. 1167). Post’s results found that when women led cross-departmental groups, they were more likely to bring about “cohesion, cooperative learning, and participative communication” between the groups (p. 1167). When groups participate in cooperative learning, they see their output as connected to the group verses the individual. This in turn motivates the team to continue to work together. Cohesion is best understood within two dimensions, that of task and social. Dr. Rodin notes, “I chose to assign leadership, management, and communications responsibilities for the West Philadelphia Initiatives across all of the University’s major administrative departments (2007, p.48). Furthermore, she notes that this was the “key defining characteristics of Penn’s
approach to neighborhood revitalization” (2007, p.49). Cohesion around task was achieved through the social connection these groups achieved as they participated in this cooperative learning environment.

She used this method to achieve five desired goals of the West Philadelphia Initiative. These goals included: a clean and safe neighborhood, a stable housing market in West Philadelphia, the establishment of contracts with local businesses, the attraction of shops, restaurants, and cultural venues, and finally, the improvement of West Philadelphia’s public schools (Perry, 2010; Rodin, 2007).

AN ECONOMIC FOCUS

Dr. Rodin practiced sound local economic development planning. Using data, she was able to assess the strengths and weaknesses of the West Philadelphia neighborhood. While the community had human resources assets and educational and training opportunities, these were confined to the university itself, so that there was little infrastructure beyond the walls of the “gown”. She was able to target zones of economic distress and understand the geography of employment in the area, which was either migrated outside of the city or contained within the university itself. Using the university, she expended capital to create resources for creating new businesses or expanding existing, but struggling ones. Ultimately, this attracted new employment opportunities, which created secure jobs and a stabilized community.

Local economic development involves equality and sustainability (Leigh & Blakely, 2013). Proper economic improvement would engage in equality by creating a minimum standard of living that all could succeed with and grow from. West Philadelphia residents surrounding the university had a subpar standard of living. When a minimum standard of living is established, inequality is reduced. In order to reduce inequality between current and future generations, good economic development involves sustainable resource use and production (Leigh & Blakely, 2013). Dr. Rodin achieved both. Dr. Rodin used the “creative class”, a term coined by Richard Florida (2002), to develop the initiatives that result in a new economy. One that is knowledge dependent, global, entrepreneurial, technology focused, and innovative (Atkinson & Correa, 2007).

While this was a comprehensive undertaking, Dr. Rodin was realistic that social change fails when there is bias regarding how things should be. Hence, the iterative process of problem solving was used to avoid the master plan approach and was replaced with an experimental approach. While time consuming, the iterative process ensures that implementation of plan will be feasible (Lee, Steven, & Timothy, 2011). This approach will be demonstrated below through an examination of her first priority, which was to create a clean and safe West Philadelphia. This consequently gave her the legitimacy she needed to achieve success as a presidential leader.

LEGITIMACY

Bornstein (2009) purports that legitimacy is critical for female presidents to achieve given that their inherent uniqueness of not being the traditional male will create a dissonance
that will be automatic and often negative. Achieving legitimacy will depend on five intersecting factors: Individual, institutional, environmental, technical, and moral legitimacy. Dr. Rodin established legitimacy through achieving success with all five of these factors.

Individual legitimacy, the first factor, refers to the influence of the president’s character. During an interview with the New York Times, Dr. Rodin described herself as a risk taker who did not play the traditional game of being seen and not heard (Kelsnikov-Jessop, 2014). Dr. Rodin herself described four characteristics that set the foundation for her leading the West Philadelphia Initiative. These were strength, courage, ambition, and passion (Kelsnikov-Jessop, 2014). Strength and courage underlies her risk taker mentality. She upheld these in the face of initial push back from her trustees who felt it would be better to spend time and effort on academics and recruiting more talented staff than fixing the neighborhood. In fact, she saw the success of the Initiative as potentially achieving these goals (Rodin, 2007). Her ambition and passion were demonstrated by four drivers; she was a woman and her leadership would be scrutinized, she would be judged by accomplishments, she was a mother who cared for her neighborhood and her alma matter, and she believed in political activism and given her unique situation, action had to happen sooner than later.

The second factor, or institutional legitimacy, refers the ability to fit into the culture of an institution (Bornstein, 2009). Being a woman, Dr. Rodin automatically did not fit into the Penn culture. Seeing her presidency as both an opportunity and a burden, she had to challenge the male prototype (Basinger, 2003). She achieved legitimacy, not through playing golf in order to sway the men on her board to invest in the West Philadelphia project, but through approaching her initiatives in the spirit of the mission of Penn; she would use discovery as the method of research (“About Penn,” 2014). Dr. Rodin utilized two main groups as part of the initiative. One involved the senior leadership (i.e. the board of trustees) and one involved faculty and students. Within these groups, there were representatives from each department at Penn, from the Office of Real Estate, to the School of Penn Design. Each group was given a small task to analyze and come up with a solution. These small tasks would bring about obtainable change and in return motivate members to stay the course with the next issue to address. One example was using the improvement of lighting in the neighborhood as a catalyst for support of the initiative. The program, called University City Brite (UC Brite), secured $25,000 from Penn and 4 property owners in the area to reimburse home-owners for installing lighting along the sidewalks in front of their homes (Rodin, 2007). The short-term outcome of this “experiment” was an instant and visible change to the area and therefore, a sense of success. The secondary outcome was that the new lighting created neighborhood block associations, which in turn motivated other sections of the area to improve their lighting. This small problem solving measure took the focus off her questionable prototype as action speaks louder than words (and it was less expensive than using golf as the forum to get buy in).

Environmental legitimacy, the third factor, speaks to the ability of leadership to be decisive in all decisions regarding the external environment, such as economic issues, enrollment, crime, etc.… (Bornstein, 2009). Dr. Rodin’s iterative process established her environmental legitimacy. Analogous to a web, Dr. Rodin was in the center of all initiatives. Interestingly, she was seen as the decision maker, when in reality, her heterogeneous teams were breaking down small tasks, reporting the outcomes, and using the consequences to
address subsequent issues. Women often seek consultation from others. Bornstein (2009) notes that women fail when the consultation becomes so laborious that decisions never are made. Dr. Rodin had the process make the decision for her, which gave an image of competency. One example of this, given the safe neighborhood initiative, is when she centralized business functions in order to cut costs and get Penn back in the black (Basinger, 2003). Through centralization, she was able to hire local welfare to work recipients to provide the services on campus versus contracting outside for services. The outcome of this was a surplus of funds that she could invest in both academic needs and the West Philadelphia Initiative. For example, she employed Safety Ambassadors who monitor not just the campus but also the streets surrounding the campus.

Dr. Rodin also achieved the fourth type of legitimacy, that of technical legitimacy. This type of legitimacy refers to the actual management of an institution (Bornstein, 2009). As noted previously, Dr. Rodin utilized a faculty and student make up of committees for the Initiative. Decisions could then be academically informed. This was most apparent in the improved schools initiative where students and faculty provided cutting edge educational expertise to schools in the area (Rodin, 2009). Dr. Rodin was able to manage the university and uphold the vision of the university as a research institution while simultaneously fulfilling the initiative.

The last type of presidential legitimacy is that of moral legitimacy which relates to ethics and authenticity (Bornstein, 2009). The West Philadelphia Initiative was an exercise in moral legitimacy. The desired goals of the project were undergirded by ethical and moral standards, as was her approach to presiding over the university. Bornstein (2009) describes female presidency leadership as generative in that it is often characterized by the encouragement of collaboration, the empowerment of others, with the leader as the facilitator. This non-hierarchical approach to leadership is an appropriate match to a growing and dynamic university but requires swift action. Generative leaders uphold innovation based on matching the environment to the system (Hazy & Surie, 2006). This is true of the West Philadelphia Initiative where town and gown intersected and rather than a top down approach, a collaborative approach between sub-systems occurred. This fits Central Place Theory of economics where the center supports smaller businesses that provide resources (Leigh & Blakely, 2013). In this, the neighborhood acts as the supporter of the urban center, rather than the gown supporting the town. Inherent in the initiatives was a moral obligation to improve and save lives in a blighted town using the expertise of the gown. Dr. Rodin showed moral legitimacy that was action oriented through this initiative.

CONCLUSION

In conclusion, the West Philadelphia Initiative provides an example of how Dr. Rodin achieved what Bornstein (2009) proposes is the three-stage process of legitimacy. Through the vision of the initiative, she established legitimacy as a new president (embodied through individual legitimacy). Second, she created legitimate change (realized by institutional, environmental, technical, and moral legitimacy). Third, she assured that there is a legitimate successor at the close of a presidency who would carry her vision forward. This final piece would require the ability to find a successor who had the skills necessary to achieve all five factors of legitimacy. Dr. Amy Guttman was chosen because she was seen as having the
energy and drive to carry out the long-term mission of the West Philadelphia Initiative (Basinger, 2003). This exemplifies a president’s legitimacy, to leave a legacy that is carried forward. The West Philadelphia Initiative is the foundation of Dr. Guttman’s Compact 2020 (“Penn Impact,” 2014) which has evolved greatly since the time of Dr. Rodin but has the same goals of uniting town and gown in a reciprocity that benefits both for the good of all. Like Dr. Rodin’s figurative search for legitimacy, Dr. Guttman is also navigating the path to legitimacy with a solid foundation and civic legacy cultivated by her predecessor.

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THE ECONOMIC BENEFITS OF TRADE DEFICITS

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ABSTRACT

This is a theoretical paper that addresses potential positive effects of trade deficits, as well as the economic benefits of free trade and the economic harm caused by tariffs. David Ricardo’s theory of comparative advantage suggests that if two countries focus on production of goods and services for which they have comparative advantages, combined total output of both countries will increase, and trade will benefit both countries. Tariffs on imports will cause prices of imports to rise. Although domestic producers of the same goods and services benefit, purchasers pay more, and thus have less money to buy other goods and services. Producers of those other goods and service will be harmed. Exports will also fall. If a country has a trade deficit, the resulting decline in both imports and exports will likely result in a continuing trade deficit. A trade deficit is not necessarily detrimental. A trade deficit means that foreign investors are buying assets such as capital goods and U. S. government bonds. The purchase of capital goods provides for the financing of economic growth and the purchase of government bonds provides financing of government budget deficits.

INTRODUCTION

The issue of trade deficits has been a topic of concern for a number of years. Economics textbooks (Lindert, 1986; Mankiw, 2004; Samuelson, 1980) define a trade balance as the difference between a country’s exports of goods and services and its imports of goods and services. If exports exceed imports, the difference is a trade surplus. If imports exceed exports, the difference is a trade deficit. The U. S. Census Bureau (2019) reports that for 2018, total imports of goods and services was $3.123 trillion, total exports of goods and services was $2.501 trillion and the balance was a total trade deficit of $622 billion.

Some politicians suggest that trade barriers, such as tariffs, can lead to reduced trade deficits and economic benefits. The inference appears to be that if tariffs were to make imports more expensive, imports would fall. The higher price of imports would make domestically produced goods and services competitive. Domestically produced goods and services would replace the goods and services that had been imported. If the argument were carried to the extreme of total elimination of imports, the $3.1 trillion of imports in 2018 might be replaced by domestic production. Tariff proponents might envision a booming economy as domestic production expands to replace the eliminated imports.

The preceding description of tariffs leading to a booming economy is contrary to economic theory. This paper addresses the economic benefits of international trade, the economic harm caused by tariffs and the potential benefits of trade deficits.
THE THEORY OF COMPARATIVE ADVANTAGE

Economics textbooks (Lindert, 1986; Mankiw, 2004; Samuelson, 1980) describe David Ricardo’s theory of comparative advantage. Producers in different countries produce goods and services at different degrees of efficiency. In some cases, producers in a country may have an absolute advantage over producers in another country. An absolute advantage means that the inputs necessary to produce a good or service is less than in another country. For other goods and services, producers in one country may have a comparative advantage in producing a good or service. A comparative advantage arises if the ratio of inputs used in the production of a good or service in one country is smaller than the ratio in another country. Even if a country were to have an absolute advantage in producing all goods and services, another country will likely have a comparative advantage in producing some goods and services.

If two countries each have comparative advantages in producing some goods and services, both countries could benefit by trading. If producers in each country were to specialize in producing goods and services for which they have comparative advantages, the combined output of the two countries would increase. If producers in each country were to then exchange the goods and services for which they have comparative advantages for goods and services for which the other country has comparative advantages, each country would have more goods and services than they would have in the absence of trade.

Some examples of beneficial trade are obvious. Bananas, rubber, cocoa beans and coffee beans are products that would be difficult to grow in non-tropical countries. Fruits and vegetables imported from South America to North America during the winter would similarly be examples of products for which domestic production would not be practical. For other products, such as petroleum, domestic production may not be sufficient, or, increasing domestic production may be prohibitively expensive. However, if, as described in the preceding, another country has a comparative advantage in producing petroleum, importing petroleum from that country would be warranted. If a country produces products that require petroleum, the importation of petroleum can contribute greatly towards economic output.

For products that a country has the ability to produce in sufficient quantities, the benefits of trade may not be as obvious. There may be a natural inclination to protect domestic industries. However, if other countries have a comparative advantage in the production of some goods and services, importing those goods and services would be beneficial. Imported products would cost less than the same domestically produced products. The cost savings could be used to purchase other products. Capital assets that would otherwise be invested in inefficient production could instead be invested in more efficient production in industries for which the country has a comparative advantage.

ADVERSE EFFECTS OF TARIFFS

The imposition of tariffs on imports would reverse the benefits of free trade. Economics textbooks (Lindert, 1986; Mankiw, 2004; Samuelson, 1980) suggest that if tariffs increase the cost of imports to purchasers, the higher prices will lead to a drop in the number of units sold. If the resulting price of imports were greater than the price of domestic production, sales by domestic producers would likely increase. The result would be a benefit to those domestic producers. However, tariffs would be detrimental to buyers. Those who pay the
higher prices would have less money to spend on other goods and services. Accordingly, while tariffs may lead to increased sales for some producers, those increased sales will be offset by reduced sales for other producers. Tariffs would distort the market to artificially support inefficient industries, causing total output to fall.

To illustrate potential adverse effects of trade barriers, suppose that the U. S. government were to impose a prohibitively high tariff on the importation of rubber, effectively banning the importation of rubber. Vehicle producers and other users of rubber would find it necessary to purchase rubber from domestic rubber producers. To produce rubber domestically would likely be very expensive. It might require the construction of special hothouses and the use of special soil. Maintaining the hothouses and caring for the rubber trees would likely be labor intensive. Some people would benefit. The companies that produce building materials for the hothouses and the companies that sell the special soil would benefit. The construction workers who build the hothouses would benefit. The employees who work in the hothouses would benefit.

Many others would be harmed. The domestically produced rubber would be much more expensive than imported rubber. Vehicles, rubber hoses, rubber gloves and every other product that uses rubber would be more expensive. Buyers would have less money to purchase other goods and services. The producers of those other products would lose sales. Capital that otherwise would be efficiently invested would be diverted to the inefficient production of rubber. Workers who otherwise would be employed by efficient industries would instead become rubber industry employees.

In addition to the detrimental effects of higher prices of imports, tariffs harm exporters. Foreign governments typically respond to tariffs by imposing tariffs of their own. Those tariffs raise the price of exports to foreign buyers, who then reduce their purchases. Even if foreign governments did not impose their own tariffs, market forces would cause exports to fall.

If a tariff on imports were to lead to a decrease in imports, foreign producers would receive fewer dollars. If potential foreign buyers had fewer dollars to spend, they would purchase fewer American products. Accordingly, exports would fall, harming export industries.

SMOOT-HAWLEY TARIFF ACT EXAMPLE

Tariff critics (Amadeo, 2019; Little, 2018) suggest that the aftermath of the Smoot-Hawley Tariff Act of 1930 illustrates the potential harm caused by tariffs. The Act raised tariff rates on thousands of imported products. Foreign governments responded by raising their tariffs. During the ensuing years, international trade fell by 65%. The stock market declined and the depression deepened. Although the Depression of the 1930s likely had many causes, tariffs appear to have contributed to the severity of the Depression.

Possible adverse effects of The Smoot-Hawley Tariff Act of 1930 may make an observer wonder if recent stock market performance has been affected by tariffs. News stories (Gonzales, 2018; Janeway, 2018) reported that on January 22, 2018, The U. S. government announced increased import tariffs on solar panels and washing machines. The Market Summary website (2019) shows that on January 26, 2018, the S & P 500 index reached a peak of 2,872.87, and then fell sharply. Since January 2018, additional tariffs have been imposed, and the stock market has fluctuated widely. As of June 3, 2019, the S & P 500 index was 2,744.45. During the 16 months between January 26, 2018 and June 3, 2019, the
S & P 500 index fell by 4.47%. Such poor stock market performance seems contrary to what would be expected during a period of economic growth and a low unemployment rate. It seems to suggest that stock market investors sense that something is wrong. Recent stock market performance could be consistent with investors’ perceptions that tariffs will cause economic harm.

IMPLICATIONS OF TRADE DEFICITS

As stated in an earlier section, economics textbooks (Lindert, 1986; Mankiw, 2004; Samuelson, 1980) define a trade balance as the difference between a country’s exports of goods and services and its imports of goods and services. If exports exceed imports, the difference is a trade surplus. If imports exceed exports, the difference is a trade deficit. Economics textbooks (Lindert, 1986; Mankiw, 2004; Samuelson, 1980) also state that if a country has either a trade surplus or deficit, the balance is offset by net capital flow. If a country has a trade surplus, net capital outflow will arise as investors buy assets in other countries. If a country has a trade deficit, investors in other countries will buy assets in that country. When the United States has a trade deficit, the deficit is offset by foreign investors purchasing assets such as factories, equipment, corporate stocks and bonds, and in particular, United States government debt securities.

Such foreign investment can be beneficial. If foreign investors purchase productive assets, the investment can finance economic growth. Foreign investors purchasing U. S. government debt securities help to finance the U. S. budget deficit. The combination of substantial imports and a trade deficit can contribute to prosperity for both foreign and domestic economies. The purchase of imports enables foreign economies to grow through increased production by their efficient industries. Foreign producers can then afford to import more goods and services. Foreign purchases of exports enable growth of the domestic economy through increased production by efficient domestic industries. And, as stated above, the foreign investment in domestic capital assets and government bonds contributes to domestic economic growth.

If the trade deficit were somehow reduced, foreign purchases of capital assets would decline along with the benefits of those purchases. If a lack of foreign investment were to make necessary a shift by domestic investors from investments in productive assets to U. S. government bonds, economic growth could further decline.

George Alessandria (2007) and Martin Feldstein (2017) point out that a trade deficit arises because there is a savings and investment shortfall by domestic investors. If increases in tariffs were to cause both imports and exports to decline while the savings and investment shortfall stayed the same, the magnitude of a trade deficit would likely remain roughly the same. The tariffs would damage the economy without reducing the trade deficit. A reduction in the trade deficit would require increased savings and investments, reduced government budget deficits, or both.

If increased tariffs were to cause a recession, the result could be greater government budget deficits, and thus a greater need for government borrowing. If increased budget deficits were to lead to greater foreign investment in U. S. government bonds, the tariffs could have the ironic effect of increasing the trade deficit.

CONCLUSIONS
Some politicians suggest that imports and trade deficits harm the economy and that tariffs should be imposed. The implication appears to be that tariffs on imports can create economic growth and reduce trade deficits. This suggestion is contrary to economic theory. A more likely outcome is that increased tariffs would cause economic growth to be stunted and trade deficits to increase.

This paper addresses the benefits of international trade, the harmful effects of tariffs, and possible economic benefits of trade deficits.

The benefits of international trade can be illustrated by David Ricardo’s theory of comparative advantage (Lindert, 1986; Mankiw, 2004; Samuelson, 1980). If two countries each have comparative advantages in producing some goods and services, both countries could benefit by trading. If producers in each country were to specialize in producing goods and services for which they have comparative advantages, the combined output of the two countries would increase. If producers in each country were to then exchange the goods and services for which they have comparative advantages for goods and services for which the other country has comparative advantages, each country would have more goods and services than they would have in the absence of trade.

Some producers in each country would be harmed by trade. Domestic producers of imported goods and service would lose sales. However, buyers would benefit by the lower prices. Buyers would have more money to spend on other goods and services. The producers of those other products would have increased sales. The overall effect would be a shift from inefficient production to efficient production.

The effects of tariffs on imports would be the reversal of the benefits of free trade. Tariffs increase prices which results in reduced sales of imports and increased sales for domestic producers of the same products. Domestic producers of those goods and services would benefit. However, higher prices of those previously imported goods and services would mean buyers have less money to spend on other goods and services. Producers of those other goods and services would lose sales. Governments in other countries typically retaliate with tariffs of their own, resulting in a reduction of exports. Also, a reduction in imports means that producers in other countries have fewer dollars to spend. Accordingly, exports are further reduced.

If imports and exports were to both decline, a trade deficit might remain the same. George Alessandria (2007) and Martin Feldstein (2017) point out that a trade deficit arises because there is a savings and investment shortfall by domestic investors. Unless saving and investing were to increase, a trade deficit would likely persist.

A trade deficit is not necessarily detrimental. A trade deficit is offset by foreign investment in the United States. If foreign investors purchase productive assets, the investment can finance economic growth. Foreign investors purchasing U. S. government debt securities help to finance the U. S. budget deficit. The foreign purchase of U. S. government debt means that domestic investors who otherwise would invest in U. S. government debt are able to invest in productive assets, further enhancing economic growth.

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ECONOMIC ISSUES PREVENTING GOOD HEALTHCARE

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ABSTRACT

The purpose of this systematic review is to outline some of the challenges (and potential opportunities) inherent with the current economic evaluation of healthcare and how they are impacting the quality of healthcare. From the search of the literature, the following factors were identified as impacting good healthcare: Ethical, Society, Research, Custom, Process, and Payment issues. These are discussed.

Economic issues can be influential in causing health problems and in preventing good healthcare practices. In the United States, even the rich are being deprived of good healthcare because of the difficulty in assessing true healthcare costs.

INTRODUCTION: CHANGING DOMAIN OF HEALTHCARE ECONOMICS

The world of healthcare (especially the economics of healthcare, the healthcare potential of chronic disease prevention, workplace healthcare, wellness, and integrative healthcare) in the United States has changed drastically over the past few decades due to a variety of reasons. The rising costs of healthcare is most often cited as the main reason, but there are others. The Patient Protection and Affordable Care Act of 2010 and the repeated attempts to defang or eliminate it might be another reason. The increased use of Electronic Health Records which makes comparative economic health research much easier to accomplish very likely is another. The extremely high cost of some procedures and medications might be another. The focused attention on overtreatment and wasted costs might be another; and a growing body of evidence suggests that there is more to treatment than drugs and surgeries. This appears to be especially true with the increased incidence of chronic health problems that occur as the population grows older and lives longer. Certainly this is another reason.

The state of healthcare research has also changed drastically. The search terms and the numbers of articles found eight years ago, listed in Table 1, tell the story of vastly changing resources for research. In 2012, the search for articles from July 2005 to June 2012 found an at-the-time-impressive 14000 articles. The exact same search done in May of 2019 for an
equivalent time frame (previous seven years, July 2012 to May 2019) found over four times as many articles: 61,561. The number of searchable journals and the number of databases has expanded since 2012. The quality of the articles has expanded. And the economic health data is much more available.

A key question is: what can we learn from a systematic review of the literature on the economics of healthcare, especially with the development of integrative health, for the seven years before 2012 and the seven years after 2012? What themes arise from the literature on the economics of a more integrative management of healthcare, and what are the logical next steps based on those themes?

METHODS

The original 2012 search was done for a project which proposed utilizing a binary logistical regression analysis to identify the factors influential in a predictive model known as the Thrive Index (Rhoads, 2012). The Thrive Index model was conceived to predict the chances that a person will survive a treatment with a high quality of life (i.e. Thrive after the treatment). The Thrive Index was categorically the opposite of the typical economic outcomes, and it would have been used to calculate the number of quality years based upon a comparison of treatments. The Thrive index was designed to take into account many factors such as lifestyle, heredity, and ability to fulfill their role in life, and represented a personalized and individualized "health risk number" for each person, similar to the way the Fair Isaac Corporation (FICO) score represents a personalized and individualize credit risk number. The original project for the Thrive Index was dropped for political reasons and the terminology (Thrive Index) was subsequently appropriated for a completely different purpose a few years later. But the concept of a health risk assessment number has been renewed as our healthcare costs have risen. Various Health Risk Assessments have been bandied about by many different academics and health-oriented economists in the intervening seven years.

In order to optimize the benefit from our 2012 project we changed the original study question of this project from a descriptive to a comparative description. As a result we can describe a development, comparing before and after, instead of only a single current state.

The search of the literature done for that project was a deep look at the exact same issues that influence whether economics interferes with good healthcare. In addition to building on already-accrued knowledge, the seven-year comparison may be educational and instructive in and of itself. Basically it was an original attempt at a comparison of the literature in the seven years before a major upheaval in the United States healthcare system, and the seven years after.

In both cases, the following academic databases were searched for articles on methods of economic analysis for healthcare:

- Academic Search Complete
- Alt HealthWatch
- Business Source Complete
- EconLit
- Health Source: Nursing/Academic Edition
- MEDLINE
In the initial search in 2012, we found 15,567 articles using the search terms in Table 1. 14,434 articles had full text and were not duplicates, and these titles were scanned based on their fit of the original search terms.

The initial search resulted in 15,567 titles. Duplicates were first eliminated, and then articles for which full text was not available (total eliminated 1133). Of the 14,434 remaining articles, the titles that were obviously not appropriate for the study were eliminated (5333). The abstracts of the resulting list (9101 records) were manually reviewed. We included the article if it met one of these criteria:

- Provided a systematic review or meta-analysis on healthcare cost research.
- Described a randomly controlled study with specific financial analysis on a common ailment.
- Provided a theoretical framework or statistical model for cost benefit research.
- Discussed issues with cost benefit models and measurements.
- Estimated the impact on society costs of general ailments.
- Discussed various healthcare models and cost impacts
- Additionally, 8675 were eliminated for one of the following objective reasons:
- Not involving a financial analysis - no society or cost impact.
- Only involving a pure financial analysis - no reference to quality of life or society cost.
- Different article utilizing data from study already published.
- Dealt only with single malady with no societal implications.
- Dealt only with a single treatment with no societal implications.

Additionally, articles could be eliminated for subjective reasons:
- Not sufficiently rigorous.
- Design not sufficiently documented.
- Too specific or population too narrowly defined.

After reviewing the abstracts, 426 articles were chosen to be included. This review resulted in 117 articles on the research frameworks and models of healthcare costs, 217 articles on the estimated impact on society costs of various models, 28 systematic reviews or meta-analysis, and 64 articles of randomly controlled comparisons of treatments and/or chronic health issues that are most likely to impact society’s healthcare costs such as diabetes, hepatitis, stroke, obesity, etc. Note that there was no attempt made to create a mutually exclusive or comprehensive list of chronic health issues; a few articles of various health issues were chosen as representative in order to validate/verify the framework and model information discussed in the economically-oriented articles.

Our thinking was that a direct comparison on the topics could be made. However, we were unable to do that comparison due to the increased volume of research.

Using the same search terms, the revised search in 2019 resulting in 61,561 articles. This was too many articles even for a team of researchers to review. At that point we chose to simply utilize the earlier search instead of trying to do a direct comparison. So starting with the original 2012 search criteria, we added a set of criteria for the 2019 search; Integrative Health.

We know from earlier work that Integrative Health (also known as complementary or alternative or integrative medicine) is a good candidate for cost-effectiveness and cost savings (Charness & Jahnke, 2012). Many researchers feel that economic evaluation is necessary in order determine if healthcare costs can be avoided through the use of Integrative Health (Herman, 2018). Narrowing the search parameters by adding "Integrative Health" in
the later search to the criteria resulted in only 96 articles being chosen for further review. After reviewing the abstracts of those 96 articles, 81 articles were eliminated using the same inclusion and exclusion criteria as the 2012 search. That left 15 additional articles to be included in this review from the 2019 search.

We also returned to the original list of 426 articles from the 2012 search with our new lens of Integrative Health. While we couldn't go back in time and add a new search term, we could manually review the articles again. After reviewing the 426 articles again, 302 were eliminated as not applicable to Integrative Health, and 50 were eliminated due to outdated data. 74 were selected to be included. The articles were reviewed in full and summarized. Both searches are graphically illustrated in Figure 1.

![Figure 1. Graphic illustration of search.](image)

RESULTS

The final results of our search were the 89 articles discussed within this paper. Each article was read and grouped on potential themes until summarizing categories became apparent. This entire process from title review and abstract scan to paper review took more than a year (2012 to 2014) for the initial search. The second process took about six months.
Table 1. Comparison of Numbers for 2012 and 2019 Search

<table>
<thead>
<tr>
<th>Search Terms</th>
<th>2012</th>
<th>2019</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Impact and Healthcare</td>
<td>5907</td>
<td>39365</td>
<td>6.7 fold</td>
</tr>
<tr>
<td>Cost Impact and Quality of Life</td>
<td>4649</td>
<td>17415</td>
<td>3.7 fold</td>
</tr>
<tr>
<td>Cost Impact and Quantity of Life and QALY (Quality Adjusted Life Years)</td>
<td>3849</td>
<td>4233</td>
<td>1.1 fold</td>
</tr>
<tr>
<td>Cost Effectiveness and Cost Analysis and Health care reform and Health Insurance</td>
<td>29</td>
<td>548</td>
<td>18.9 fold</td>
</tr>
<tr>
<td><strong>Total Number of Articles Reviewed:</strong></td>
<td><strong>14434</strong></td>
<td><strong>61561</strong></td>
<td><strong>4.3 fold</strong></td>
</tr>
</tbody>
</table>

It is interesting to note that the largest change occurred in Cost Effectiveness and Cost Analysis and Health Care Reform and Health Insurance, as can be seen in Table 1. It might be posited that the explosion was due to the seemingly sudden change in healthcare due to the implementation of the Patient Protection and Affordable Care Act of 2010 in the United States, but further observation is needed as the numbers are too small for solid conclusions. It should also be noted that the number of articles with QALY (Quality of Life Years) stayed about the same.

As noted earlier, the search in 2019 was for an equivalent time-frame, seven years. The timing was not coincidental. The year 2012 was a monumental year for healthcare in the Unites States as that was the year the first sections of Patient Protection and Affordable Care Act (PPACA) of 2010 were implemented. By 2015 PPACA was fully implemented until the 2016 election when its future was again in doubt, as major sections were eliminated or not enforced by the new administration.

*Themes from Systematic Review on Healthcare Cost Issues*
After reviewing all articles, it was apparent that the articles fell into several economic categories: Society, Ethical, Research, Custom, Process, and Payment. A graphical representation of the proportion of articles for each category can be found in Figure 2.

![Proportion Articles of each Category](image)

*Figure 2. Proportion of Articles found in each Category, both Before and After June 30, 2012.*

The total number of articles within each of the categories is summarized in Table 2.
Table 2. Frequency of Articles by Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethical</td>
<td>23</td>
</tr>
<tr>
<td>Society</td>
<td>9</td>
</tr>
<tr>
<td>Custom</td>
<td>10</td>
</tr>
<tr>
<td>Payment</td>
<td>11</td>
</tr>
<tr>
<td>Process</td>
<td>9</td>
</tr>
<tr>
<td>Research</td>
<td>27</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>89</strong></td>
</tr>
</tbody>
</table>

Additionally, for purposes of the discussion of each category, several government-sponsored reports and white papers were included in the reviews. When dealing with healthcare costs, it would be foolish to ignore the resources of think tanks and the United States Government and their ability to provide statistics, trends, and analysis of healthcare.

**Society Issues**
Society issues are healthcare quality factors that are impacted by the economic issues of our whole society: rising costs of healthcare, growing senior population, and increased prevalence of chronic conditions.

**Rising Costs of Healthcare**
Healthcare costs have increased compared to previous years, and are expected to continue to grow, as can be seen in the graph of healthcare costs compared to Gross Domestic Product (GDP) in Figure 3, which came from Centers for Medicare and Medicaid Services, National Health Expenditure Accounts. (The tables from 2017, published in January of 2019 are available from http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/tables.pdf.) These rising costs were leveling between 2012 and 2016 when PPACA’s implementation made an impact, but now are rising again as important mandates of PPACA designed to lower costs were removed.
In 2018, healthcare costs in the United States covering 327.2 million people were $3.6 trillion dollars ($11,002 per person). To put that in perspective, that is ten times the cost of all military spending of the government each year for the past 20 years (which was only about 300 billion dollars each year) (Crawford, 2018). If the healthcare system does not change, the health costs will increase to over $17,200 per person by 2027, 19.4% of the GDP. There are many reasons for the rise in healthcare costs that are explored in depth in the literature, but for purposes of this article it is enough to note that healthcare beyond the ability of people to pay is not actually healthcare, but health non-care.

Growing Senior Population

Part of the problem is the growing percentage of baby boomers entering their senior years designated by the press the "Silver Tsunami" (Seals, Justice, & LaRocca, 2016). The number of people over 65 is expected to double, and the number over 80 will triple by 2050. Seventeen percent of GDP is spent on people over 65. The basic healthcare system developed to handle broken arms and traumatic accidents is not optimized for the chronic illnesses which impact 45 percent of the population, and are especially common among older people (Kumar & Nigmatullin, 2010; Kumar & Prevost, 2011). The healthcare costs of seniors are three to five times that of a younger person (as can be seen in Figure 4). If they have multiple chronic conditions, costs can be seven times more shown in Figure 5 (CDC et al., 2007). Society is facing much higher than expected costs and lower quality of healthcare as a result (Martini, Garrett, Lindquist, & Isham, 2007).
Growing Chronic Conditions and Diseases

Chronic conditions and diseases came up again and again throughout the literature as a major problem in today’s healthcare. Seniors are not the only ones who are suffering more and more from chronic conditions (Seals et al., 2016).

Each year the United States population spends $128 billion on patients with arthritis, $148 billion on patients with Alzheimer’s disease, $174 billion on patients with preventable type II diabetes, and over $432 billion on heart disease and stroke (Avila, 2011). Another $120 billion is spent on chronic autoimmune disorders such as Graves disease, lupus,
vasculitis, anemia, celiac disease, and a host of others (Nakazawa, 2008). Eighty-five percent of each person's Medicare dollars are spent on preventable chronic conditions. The current system rewards treatment, not prevention (Knauf & Aronson, 2009). Seventy-five percent of each healthcare dollar currently goes to chronic illnesses that are easily preventable (Freudenberg & Olden, 2011).

Centers for Medicare and Medicaid Services published a report that shows that there has been a steady increase in post-acute care services as the number of chronic conditions increase, with at least 41 percent of the Medicare beneficiaries needing post acute care. They also noted that beneficiaries with multiple chronic conditions were more likely to be hospitalized, had more hospitalizations during the year, and that more than two-thirds of Medicare beneficiaries had multiple chronic conditions. They indicated far reaching implications of chronic illnesses for the healthcare system built on a fee-for-service model, and noted that it was important to understand the impact (Lochner, 2012).

The current healthcare system is set up for diagnosis and treatment; it does not deal with the issue of prevention and healthy lifestyle (Hoffman, 1997; Kurzweil & Grossman, 2004; Weil, 2000). There is very little support for lifestyle change guidance such as nutrition counseling, exercise programs, weight maintenance help, vitamins and supplements, stress reducing activities, etc., though the research is overwhelming that lifestyle changes are essential for the abatement of rising healthcare costs. (Anderson et al., 2009; Artnak, McGraw, & Stanley, 2011; Gallelli, Wells, Peltonen, & Groden, 2011; Mattke et al., 2010). Even the word "prevention" in the current healthcare system often only means undergoing diagnostic tests such as colonoscopy, mammogram, and pap smears, all of which can only treat a disease once it has started rather than focusing on behaviors and practices that prevent them from starting (Alexa, Marian, Jae Hak, Diana, & Stephanie, 2010).

The World Health Organization identifies healthy lifestyle issues as a global health risk. Figure 6 shows the causal chain between lifestyle and just one of the major chronic illnesses that is growing (found on page 9 of the report) (Mathers, Stevens, & Mascarenhas, 2009). The main point of this graphic is to demonstrate the complexity of even a single disease; the cause-effect is not a simple relationship that can be shown with a linear string of boxes.
Ethical Issues are those which, while not economic issues themselves, do impact the economics in non-scientific ways. These include the non-economics principles of healthcare and end-of-life management issues.

Non-Economic Principles of Healthcare

Normal economics principles do not always apply to healthcare. One of the reasons economics prevents good healthcare is the ethical issues. With healthcare there is a desirable state of access for everyone regardless of ability to pay. Society at large does not wish to be responsible for the death of members of the community simply because they could not pay for the service (Coleman, 2011; El-Sayed, 2012; Fleck, 2011).

Additionally, many people resist the idea that financials should be part of the equation; people are often unwilling or unable to put a price on their life. Physicians ordering treatments are not expected to take financials into account. Scholars are recognizing a great concern in the community at the idea that the amount of resources available must be balanced against the outcome expected. These fears have sometimes led to an "outrage" in the media, especially while healthcare reform was under debate, accompanied with warnings of impending rationing of healthcare and so called "death panels" (Gruenewald, 2012; Kernick, 2005; Lauridsen, Norup, & Rossel, 2008; Nord, 2010; Ruger, 2008; Zunic et al., 2011).

But many people do see the value in looking at costs (Siebert, 2003). Petrou and Gray call for the use of an Incremental Cost Effectiveness Ratio (ICER) to determine if a treatment is worth the investment of public funds. The ratio would establish the maximum acceptable incremental cost ratio (Petrou & Gray, 2011). Beil reports on an interview with Dr. Thomas Smith from the Sidney Kimmel Comprehensive Cancer Center in Baltimore who noted that
"We are the only industrialized country that doesn't look at the cost balanced somehow with effectiveness in making decisions about drugs." He concludes that asking hard questions about health care is not a bad idea (Beil, 2012).

Another reason ethics is involved in the fact that healthcare does not follow normal economic principals is that healthcare is one of the industries where the providers (i.e. the doctors) are more knowledgeable about the needs of the customers (i.e. the patients) than the patients themselves are. The physicians, hospitals, and healthcare networks are trusted by the patient to do what is necessary and right rather than what would make the most money. Patients don't feel empowered to "go against the doctor's orders", so if the doctor says to get a test or undergo a treatment, they do so. Even if it is inconvenient, difficult, and unlikely to produce qualitative or quantitative value. Currently, to "opt out" of a physician ordered test or treatment requires signatures on forms that warn the patients of dire consequences if they don't get a recommended test. Courts have been known to mandate a physicians order even if the patient clearly states they didn't want it (Gallelli et al., 2011).

One difficulty patients have in opting out of testing, (and that physicians have in curtailing testing), is related to another contributor to the high cost of overtreatment: malpractice suits (Mulvany, 2010). The possibility of an astronomical malpractice settlement has greatly impacted the field (Bovbjerg & Bartow, 2003). Physicians need to order tests even though they may not be necessary simply to avoid the possibility of a suit. The high price of malpractice insurance is a considerable issue that severely limits the amount of money a physician can make in private practice (Callens, Volbragt, & Nys, 2006; Hermer & Brody, 2010).

End of Life Care Management Issues

Often we consider extending lifespan without considering healthspan. The availability of treatments that keep the body alive without quality of life has changed the community's concept of death.

Financing high-cost low value treatments uses up scarce resources and prevent low-cost, high value methods from being used more often, benefiting more people. However, the fact that it feels unethical to put finances above extension of life (even when the quality of life is not improved and the cost is extremely high compared to the value) is one way that economics issues impacts quality of care.

Years ago people lived at home, taken care of by family members until they died at home surrounded by family. Most commonly these days people live in nursing homes and die in a hospital (Mattke et al., 2010). Up to 33 percent of Medicare dollars get spent on the last year of life, and 40 percent of those Medicare dollars are spent in the last month of life (El-Sayed, 2012). While some authorities dispute the importance of these percentages because it does not take into account the total amount spent by Medicaid and private insurance (Aldridge & Kelley, 2015), it cannot be ignored that end of life costs are high, and getting higher.

What has caused the shift to nursing homes instead of home care? One influence is the changing economic structure of the family, most notably the fact that women, previously unpaid long-term care laborers, have much higher mobility and employment, and therefore are less able to serve as unpaid caregivers.

Some people believe that another influence on this change in behavior occurred in 1951, when the Department Of Health And Human Services, Centers for Disease Control and Prevention, and the National Center for Health Statistics stopped allowing physicians to notate old age as cause of death (Sondik, 2003). Elderly people who's health is failing are
constantly taken to the hospital, again and again, in an effort to "fix" the problem, even when the cause is due to old age. Well-meaning family and friends will often take a person to a hospital even when they've clearly stated they prefer otherwise (Abel, Rich, Griffin, & Purdy, 2009; Riley & Lubitz, 2010). The fear is that family members are not "doing all that they can" if they don't take a person who may be dying to the hospital. There is a resistance to the idea that someone should be allowed to die without intervention (Artmak et al., 2011).

This is not necessarily because people want to die in a hospital. More than 75 percent of survey respondents want to convalesce and die at home (Donnelly, 2012). Brumley, Enguidanos, and Jamison found increased satisfaction with palliative home care rather than usual care (which usually indicated hospital or hospice). Additionally, costs were reduced by 33 percent ("Disease Management Update," 2007). Nonetheless, more than 80 percent of people die in a hospital, hooked up to various machines, unable to return home (Abel et al., 2009; Artmak et al., 2011; Grabowski, 2007).

Treating more people at end of life at home doesn’t necessarily help with costs, however. Lupari, Coates, Adamson, Crealey identified studies that involved nurses providing care to elderly patients with multiple chronic conditions in their own homes. While the studies reported positive qualitative outcomes, there was not a significant improvement in the number of emergency admissions, bed days, nor costs (Lupari, Coates, Adamson, & Crealey, 2011). One study found that palliative care decreased costs for terminally ill children without cancer, but increased costs (along with hospitalizations and emergency room visits) for terminally ill children with cancer (Postier, Chrestek, Nugent, Osenga, & Friedrichsford, 2014).

Palliative care programs, however, are perceived as higher quality. Brumley, Enguidanos, and Jamison found increased satisfaction with palliative home care rather than usual care (which usually indicated hospital or hospice).

Often palliative care is not considered, but rather every attempt is made to extend life. Beil explored the issue of the cost and efficacy of commonly prescribed cancer drugs that have all entered the market in the last few years. Americans spent $23 billion on cancer drugs, more than spent on any other type of prescription drug in any other category. These drugs provide weeks or months of additional life for cancer patients at an extremely high cost. Perjeta, a breast cancer drug, provides up to six additional months of life at a cost of $188,000. Provenge can provide a prostate cancer patient with four additional months of life, at a cost of $93,000. Yervoy, another prostate cancer drug, costs $120,000 for four months of life. Tarceva helps pancreatic cancer patients get 14 to 16 additional days of life for about $15,000 (Beil, 2012).

Baily researches the controversy of futility of care and the ethics of cost control. Baily argues that universal access to quality care cannot be affordable unless the decision makers accept the moral legitimacy of taking cost into account in health care decisions, even decisions at the end of life (Baily, 2011).

Banham, Lynch, Karnon developed an Equity-Effectiveness framework that, if utilized by a central healthcare decision making agency, would enable proper evaluations of health interventions in applied settings with an internally consistent approach. This would help physicians make better end-of-life decisions about treatment (Banham, Lynch, & Karnon, 2011).

The Framingham Heart Study resulted in an index that assesses the 10 year risk of cardiovascular disease (Kannel, 1976). This index is widely used, and has more than 50 years
of additional research on it, allowing physicians to determine whether further interventions would be helpful (Brindle et al., 2003).

**Process**

Process issues are those where the quality of healthcare is impacted negatively because of the current process for healthcare. This includes the high administrative costs, overtreatment and waste, and lack of healthcare information technology data standards.

**High Administrative Costs of Healthcare**

Administrative costs for private health insurance plans has risen dramatically over the past ten years - by over 117 percent. Compared to the administrative costs, actual healthcare costs only rose 74 percent, so administration costs are a larger part of rising healthcare costs. Researchers estimate that administrative costs eats up more than 30 percent of the United States healthcare dollar in administration and procedures (Roth, 2010; *Thinking Outside the Pillbox: A system-wide approach to improving patient medication adherence for chronic disease*, 2009; Wikler, Basch, & Cutler, 2012).

According to the majority of healthcare researchers, the United States spends more on healthcare than any other country - and the quality of the basic healthcare is lower. Germany spends less than 6 percent of their healthcare dollar on administrative systems (M. Nelson, 2010; Roth, 2010).

Most researchers believe that the high administrative costs are caused by the disconnected, bureaucratic, and for-profit competitive nature of the current healthcare system (Wikler et al., 2012).

The literature on the reasons for the high administrative costs is also related to several other areas: the non-economic principles of healthcare, the multilayer payment structure of healthcare, the burden of overtreatment, the lack of healthcare information standards, the typical sedentary lifestyle of an American, the lack of prevention guidance, and end of life care management issues.

**Overtreatment and Waste**

Estimates range from 22 to 40 percent of the healthcare administration dollar being completely wasted, or going into a shareholder’s pocket, but not influencing the quality or quantity of healthcare (Barthold, Nandi, Mendoza Rodríguez, & Heymann, 2014; Bernstein et al., 2004; Berwick, 2003; CDC et al., 2007; Daniel, Damon, Mark, Mark, & Richard, 2012; Roth, 2010).

Brownlee explains the causes and outcomes of overtreatment, making the claim that the current system encourages disconnects between healthcare providers, unnecessary testing, and an overwhelming number of unnecessary surgeries (Brownlee, 2008).

The Atlas Project studied hospital referral regions (HRRs) in different states and determined that local capacity determined the treatment rather than standards of care. In a play on "if you build it they will come", this study determined "if you buy the diagnostic equipment, they will be tested" whether they need it or not. They conclude that overtreatment of the chronically ill is a problem, and that better coordination of care at the preventative stage is needed to avoid it (Wennberg & Fisher, 2008).

**Lack of Healthcare Information Technology Data Standards**

Lack of healthcare data standards is a major waste of healthcare dollars. Research is clear that if hospitals, physicians, healthcare networks, providers, insurance companies, and government agencies were to all use the same process, the same fieldnames, and the same codes for diagnostic, treatment, and payment, the healthcare system could save billions of dollars each year (Bouhaddou et al., 2012).
The prevailing level of data interoperability in the healthcare industry can be characterized as a mess. Ghosh and Scott proposed developing catalysts and antecedents in order to aggregate data for better healthcare decision-making, but found that even with a single system, the data was not interoperable. Systematic and semantic differences caused by diversity of data entry standards, and conflicts between multiple systems made it a real challenge to develop a working model (Ghosh & Scott, 2011).

Roth noted that in the United States, even within a single government, there is a competing hodge-podge of poorly integrated and often conflicting programs each with its own standards, computer systems, database schema, rules and policies (M. Nelson, 2010; Roth, 2010).

Gruman makes the case that the lack of health information technology (HIT) standards also drastically decreases the quality of care. He notes that the current chaotic state of healthcare delivery is increasingly fragmented and increasingly relies upon the patient to keep track of all their own medical records. He notes that people with chronic illnesses generally see many physicians, and that doctors generally do not currently communicate, even when they are within the same system or have offices in the same building. He notes that personal EHR systems are time consuming to populate, and that doctors resist them in any case, wasting whatever resources were invested in populating them (Gruman, 2011; Karapinar-Çarkit et al., 2010).

Wikler, Basch, and Cutler note that because each health care payer has their own customized data requirements for transaction, the number of hours that physicians, nurses, and clerical staff spend per week in claims and authorization is staggering. Physicians spend 43 minutes each and every day, and nurses spend half of their time (21 hours per week), while clerical staff spend 53 hours per week per physician (necessitating multiple clerical staff per physician). The healthcare industry employs more billing staff than any other industry nationwide. A typical transaction consists of eight separate steps in the revenue cycle, compared with most industries which typically only have three or four (Wikler et al., 2012).

In 1996 Health Insurance Portability and Accountability Act (HIPAA) stated that it was setting standards for identified organizations to use; but then listed 13 different sets of standards maintained by 11 different organizations (“Coding Classification Standards,” 2012). The relationship between these codes and the organizations that maintain them is so complex as to require eight different certifications to understand all of them. Employment in the healthcare industry had been largely immune to the 2008 recession, but it is not because the industry was hiring more doctors, it is because the industry was hiring more clerks to code medical records. A decade ago a staff to physician ratio of 3:1 was commonly acceptable. Now, staff ratio needs to be between 5 and 7 to 1 physician in order to keep up with the large amounts of coding necessary for all the different insurance companies and government organizations. Wikler, Basch, and Cutler point to poor policy design, weak implementation and enforcement, as well as a lack of leadership on the part of the federal government regarding data standards of HIPAA (Wikler et al., 2012).

The economics of paying for all this wasteful technology that cannot interoperate and must be replaced every few years lowers the amount available to be spent on actual health care. Though technology companies love all the extra income caused by disconnected Electronic Health Record systems, healthcare quality suffers.

**Payment Issues**
Payment issues are economic factors that impact healthcare quality simply because of the payment methodology itself.

**Multilayer Payment Structure of Healthcare**

One of the reasons why economics impacts quality of healthcare is the multilayered payment system. Because of the multilayered payment system, the cost savings due to technology implementation that is typical in normal businesses do not apply because those who pay for the technology do not benefit from the savings of technology. As a result, healthcare is the last major industry to adopt technology to better serve its users (Taylor, 2012).

The way healthcare invoices get paid makes the economically-driven rules of supply and demand less applicable than normal industries. The payer is not the recipient of the service (Schimppf, 2012a, 2012b). The only group of people who pay directly for healthcare services are the uninsured, less than nine percent of the population in 2017 (though expected to rise with the elimination of the healthcare insurance mandate of PPACA). While some uninsured patients pay out of their own pocket, many are unable to pay the high prices of care, especially emergency care. Hospitals cover billions of dollars in costs each year for uninsured patients as they are mandated to treat everyone regardless of ability to pay (Baumgarten, 2012). So even in that situation, the receiver of the service is not the payer of the service.

For the remaining 89 percent of people, healthcare costs are covered by different organizations based upon whether or not the person is employed, was in the service, is older or younger. More than 50 percent are covered by private insurance (either paid by the person or by the person's employer). Twenty-two million people also choose to supplement with a Health Savings Account (HSA). Jordan and Nocholls suggests HSA is used by people who earn more and are healthier than most (Jordan & Nicholls, 2018).

For combat veterans, the Veterans Administration (VA) covers some or all of the healthcare costs. For seniors over 65, Medicare covers 80 percent of healthcare costs. For poor people in general, Medicaid (or Medical Assistance) covers the bills (2.18 million adults), and for children, CHIP (Children's Health Insurance Program) pays for healthcare (1.26 million children) (Claxton et al., 2012).

Sometimes who we think of as the payer is not actually the payer. When an employer pays the cost of health insurance, the recipient of the service, the patient, is not even indirectly involved in the payment and the payer of the service (the insurance company) is paid by someone other than the recipient. Even in the case of public healthcare insurance such as Medicare and Medicaid, the recipient is still not the payer, the taxpayer is the payer who pays the payer, the government. Only individual self-paid health insurance has a more direct connection between the payer and the service.

Overtreatment is also related to the multilayer payment system, because there is no direct link between the amount that employers or governments pay for insurance, and the cost that is borne by the patient (Forgione, Vermeer, Surysekar, Wrieden, & Plante, 2005; Larg & Moss, 2011). Furthermore, malpractice influences overtreatment by setting defensive standard of care that requires a great deal of unnecessary testing (Bovbjerg & Bartow, 2003; Hermer & Brody, 2010).

This odd non-economic method of payment means that there is a unique relationship between the consumer (patient), the payer (the insurance company or the government), the employer (who, at times, provides the conduit to the insurance and may pay part or all of the costs), and the providers (doctors, nurses, hospitals) and their suppliers (medical equipment,
pharmacies, etc.). Mattke and the RAND team point to this "payment silos" structure of healthcare as the reason why numerous beneficial health care innovations (from the systems perspective) are not adopted. The current payment structure rewards a group other than the payers for efficiencies. For example, they note that Electronic Health Records (EHR) generally would require investment and training on the part of the providers, but the beneficiaries are the private and public insurance companies (Mattke et al., 2010). Generally, until CMS mandated the use of EHR systems for Medicare, doctors and hospitals did not invest the money despite the eventual efficiencies they might bring. Additionally, as Miller points out, the government impacts the cost of healthcare insurance by issuing mandates for required coverage (Miller, 2014).

Forgione, Vermeer, Surysekar, Wrieden and Plante advocate looking at this unique relationship in the framework of Agency Theory, through the lens of "optimal agreements governing interactions between the involved parties". Reviewing their activities through this lens can give public policy and healthcare advocates insight into rising and lowering costs. In Agency Theory, each involved party can be expected to work in their own best economic interests, so the balance between the parties must be taken into account when considering public policy. A chart outlining the different agencies (payers) and the economic issues involved in healthcare decisions can be found in Figure 7 (Conrad, 2016; Larg & Moss, 2011).

Agency Theory demonstrates why, despite significant evidence that prevention costs less than treatment, it is difficult to get insurance companies to pay for health promotion, wellness, self-care, or behavioral prevention. The financial benefits of prevention occur "downstream", most likely when some other agency would be responsible for them. Childhood vaccines, for example, often don't prevent a disease for a decade or two - by which time the insurance company covering the cost of vaccines is no longer responsible for healthcare costs of the patient. Healthy lifestyle expenses such as gym membership, nutrition counseling, classes, coaching and support groups all impact costs of chronic illnesses in a major way; but often not until the person is in their sixties, by which time it is Medicare, and not the insurance company, which pays the costs. This is also why employers are often the only ones willing and able to pay for healthy lifestyle support; they are the ones who benefit the most from healthy productive employees (Baicker, Cutler, & Zirui, 2010; Berry & Mirabito, 2011; DeVries IIi, 2010).

Goetzel and Ozminkowski reviewed the research and encouraged work health programs to be funded at an optimal investment level so that program savings can obtained. They stated that more research is needed on the optimal design and cost of interventions, and this research must reach employers for these programs to be applied more broadly (Goetzel & Ozminkowski, 2008).

Nelson, Cohen, Greenberg, and Kent reviewed 887 publications reporting 2128 cost effectiveness ratios for innovative health care. They were looking for lower cost treatments that were decrementally cost effective; giving up quality for price. The number of comparison studies that increased quality and improved health (increasing costs as well) was 1533, but they found very few (1.6 percent of the sample) that were decrementally cost effective (i.e. found equivalent alternatives to decrease costs). They concluded that because insurance tends to shield both physicians and patients from the true cost of care, there is no incentive to decrease the quality in order to save the costs. Even if the quality would only decrease slightly and the cost savings were large, there was no incentive to save the money (A. L. Nelson, Cohen, Greenberg, & Kent, 2009).
<table>
<thead>
<tr>
<th>Healthcare Related Resource Use</th>
<th>People with Health Condition</th>
<th>Family members of Person with Health Condition</th>
<th>Healthcare Insurance (public [gov] or private [employer or self])</th>
<th>Business or Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Resource Use</td>
<td>Legal representation. Childcare.</td>
<td>Damage to property (i.e. for substance abuse, smoking, crime related activities)</td>
<td>Worker replacement costs (recruitment, training, retraining). Cost of implementing and adhering to regulations and legislation.</td>
<td>Regulations, inspection and monitoring, child welfare services, disability support services, court services, police services, prison services, emergency fire services, cost of administering taxes and benefits.</td>
</tr>
<tr>
<td>Production Losses</td>
<td>Loss of revenue due to unpaid sick leave, treatment related time off from work, reduced on-the-job productivity, premature retirement due to health issues, loss of opportunity for promotion, early mortality.</td>
<td>Loss of revenue and unpaid production while caring for sick family and friends.</td>
<td>Loss of revenue due to unpaid sick leave, treatment related time off from work, reduced on-the-job productivity, premature retirement due to health issues, loss of opportunity for promotion, early mortality.</td>
<td>N/A</td>
</tr>
<tr>
<td>Intangible Burdens</td>
<td>Lower Quality of Life, impaired functioning, psychosocial impact, loss of leisure time, loss of life.</td>
<td>Psychosocial costs of caring for sick family and friends.</td>
<td>Deadweight. Loss of additional taxation.</td>
<td>Employee morale</td>
</tr>
</tbody>
</table>

*Figure 7. Components of Costs and economic issues. Simplification of a chart from Larg & Moss (2011).*
Osilla, et al, investigated worksite wellness, which the majority (58 percent) of corporations take advantage of. There is an accelerating trend of employees taking part in worksite wellness programs. They reviewed 33 studies, and concluded that despite the mostly positive outcomes, the body of evidence did not support such widespread adoption of wellness programs – not because they did not work (they did) but because the employee, and not necessarily the company, benefitted (Chan Osilla et al., 2012).

**Custom**

Custom factors are those factors that impact healthcare quality negatively simply because "we've always done it that way". Needed changes could dramatically improve healthcare, but because it's not the typical way things get done, the changes are very slow in coming. These include lack of high quality guidelines, and problems with research methodologies.

**Lack of High Quality Guidelines**

It is difficult to find consistent high quality guidelines for treatment. Gabbay, et al reviewed 92 studies, over half of which purported to provide clear guidance to clinicians as to when to determine that further actions are unlikely to help a dying patient (futility), and half of which refuted that the point of futility was reached or could be determined and therefore further action was warranted. They determined that among the 47 studies that supported withholding of treatment, they did not demonstrate clear determinable guidelines for clinicians to follow. They conclude that trying to rely upon statistically driven data to make such determinations is fraught with problems, and that physicians need to rely upon their own expertise rather than relying upon published data determining futility guidelines (Gabbay et al., 2010).

Porzsolt, et al analysed guidelines for 330 treatment recommendations for three different types of cancer from 11 countries. The recommendations were categorized as congruent, incongruent, or undetermined. A congruent recommendation matched 66% of other country’s recommendations, an incongruent matched less than 66%, and an undetermined recommendation did not clearly provide a recommendation in at least 66% of the modalities. Their results indicate that incongruent recommendations were 4-fold more common than congruent recommendations. Out of the 330 recommendations, only 50 were congruent (15%). One of the reasons proposed for the high level of incongruence was that some guidelines were based solely on random control studies, and some on the experience of the guideline authors – and they do not necessarily lead to the same conclusion for treatment (Porzsolt, Rhoads, Manzini, Lobmeyer, & Kaplan, 2019).

**Decision Making Methods**

Siebert considers economic evaluation as part of the essential decision making of healthcare (Siebert, 2003). Bong-Min researches the use of health technology assessment as a policy option in order to avoid unnecessary healthcare costs. Bong-Min found that health technology does not save money, but generally increases costs overall. Bong-Min did note that health technology assessment tools do help determine if new treatments are cost effective. He notes that some countries such as South Korea have already implemented health technology assessment policies requiring pharma-economic research (proof that a new drug will be more cost effective than what is already available) before reimbursing for prescriptions. He identifies culture, healthcare systems, and public trust in the government as factors that determine which countries will utilize health technology assessment (Bong-Min, 2009).
Decisions are influenced by availability of services. The Atlas project studied hospital referral regions (HRRs) in different states regarding how much they spent on Medicare enrollees with severe chronic illnesses. Researchers demonstrated that clinical decisions governing the frequency of use of such supply-sensitive care as physician visits, referrals to specialists, hospital care, and diagnostic testing are strongly affected by local capacity, which strongly influences both the quantity and per capita cost of care provided to patients with chronic illnesses. Their conclusion? That in-patient hospital care is not the best option. Other methods must be found to reduce overtreatment of the chronically ill in the inpatient setting, particularly by improving the coordination of care (Bachman et al., 2017; Postier et al., 2014; Wennberg & Fisher, 2008).

One of the major issues in healthcare decision making is the collaborative efforts of groups of physicians. There have been many studies on this topic. Kuhlmann, Gavin, and Galavotti evaluated 9 studies on integrating family planning services as part of an integrated health practice, and all reported overall satisfaction from the providers, clients, and community perspective, though only seven of the nine studies reported the measurement of the improvement, and none provided a cost benefit analysis (Kuhlmann, Gavin, & Galavotti, 2010).

White and Glazier reviewed 65 studies on cost benefit of hospitalists (special doctors hired by hospitals rather than traditional physicians who maintain hospital privileges for their patients). The majority show that hospitalists reduce patient stays and cost less, but don’t necessarily provide better care. The authors were concerned that the issue has not gotten better despite the amount of research on the topic indicating problems with the method of using hospitalists instead of primary care physicians. However, they were not able to identify the underlying mechanisms driving the outcomes and associated quality of care so that it could be improved (White & Glazier, 2011).

Sikorski, Luppa, König, van den Bussche, and Riedel-Heller reviewed 108 articles and chose 11 that were randomized controlled trials training general practitioners in depression care. Training alone did not improve outcomes; organizational structure changes were necessary before changes were seen (Sikorski, Luppa, König, van den Bussche, & Riedel-Heller, 2012).

Chisholm-Burns et al reviewed studies on the effectiveness of pharmacists as part of the healthcare team, and concluded that the majority of studies were limited due to partial cost analysis, study design, and inappropriate statistical analysis. They encouraged future investigators to adhere to the guidelines and recommendations of the Panel of Cost-Effectiveness in Health and Medicine (Chisholm-Burns et al., 2010).

The efficacy of specialists versus primary care physicians and drug approval decision making was also the topic of study. Chauhan and Mason investigated 29 studies (out of the 1400 screened) for the reasons behind the slow progress in new prescription medicines in the United Kingdom, and concluded that though price was not the primary factor, the fact that specialists are more likely to be involved in the Drug and Therapeutic Committees gives them more access to the details of new drugs so that they are more likely to differentiate drugs with novel actions or identify areas with few alternatives. Primary care physicians are less likely to be involved in formal purchasing decision processes, and therefore are less likely to have new drugs on their consciousness (Chauhan & Mason, 2008; Mason, 2008).

Another issue with healthcare decision-making is the current penchant to try and limit healthcare to just medical factors and interventions. Many experts believe that there is a growing base of evidence to suggest that strategies to address the social determinants of
health must be integrated into health care models in order to achieve the triple aim of improved population health with higher care quality at lower costs (Bachman et al., 2017).

Research

There are several challenges to doing healthcare research and estimating the costs of the benefits of healthcare. Problems include the cost benefit methods themselves, the lack of ability to get any accurate costs because of the plethora of payment systems, the practice of cost shifting, and the impact of utilization and volume on costs.

Healthcare Research Issues

One of the major problems of current healthcare research is that much of it is funded by pharmaceutical companies and surgical device firms (Lexchin, 2012). This causes physicians, who read the research, to rely much more heavily on costly drugs and surgeries rather than including simple and more cost effective treatments.

Integrative medicine generally relies upon more natural treatments, but does not have the same kind of research funding behind it. While there are many studies that show its cost effectiveness (Demirkol et al., 2017; Kooreman & Baars, 2012; Lien et al., 2016; Morgan, Irwin, Chung, & Wang, 2014; Selfridge, 2012; Viksveen, Dymitr, & Simoens, 2014; Wu et al., 2014; Xiong, Wang, Li, & Zhang, 2015), authors of guidelines often insist on random control trials which decreases the chance that integrative health practices will be included in the guidelines. Random control trials measure efficacy (the possibility that the treatment works under study conditions), not effectiveness (whether the treatment actually works in real world conditions). Random control trials are much more difficult to design and much more expensive to complete with integrative healthcare practices than with simple drugs or surgical devices. Physicians would not usually recommend integrative practices because they are not within the guidelines for standard of care (Menard et al., 2015).

Estimate Cost Benefits

Cost Benefit Analysis themselves have severe limitations. Although newer cost effectiveness analysis methods try to make adjustments, most cost benefit research only measures quantity of life, not quality. Since healthcare technology and practice has reached the point where a person can be kept alive almost indefinitely regardless of age or infirmity, the impact of treatments on the quality of life can be enormously important, more-so than the quantity of life. Furthermore, in research the value assigned to the life year is traditionally $50,000, the origins of which is several decades old and actually meaningless (Hoch & Smith, 2006).

There is no universally accepted standard for measuring the quality of life weights, and that estimation can result in drastically different results. Generally, researchers administer some assessment or preference based measure such as EQ-5D (EuroQol Health States), HUI3 (Health Utilities Index Mark 3), or SF-6D (a measurement of health and wellbeing). The assessments are then valued using different valuation techniques such as Time Trade-Off, Standard Gamble, Visual Analogue Scaling, Ranking and Discrete Choice Experiments.

Unger points out that Quality Adjusted Life Year (QALY) and other economic variables do not apply well to children who cannot be surveyed using EQ-5D, and often must be provided by proxy (i.e., their parents). Unger recommends considering the family perspective, and advocates a discrete-choice method for a willingness to pay model to assess different treatments (Unger, 2011).
Zimovetz, Wolowacz, Classi, and Birt reviewed 37 studies to treat major depressive disorder, and concluded that the variety of measurements (symptom free days, health state utilities, Disability Adjusted Life Year (DALY), QALY, and efficacy of second-line treatments) lead to difficulties in comparisons (Zimovetz, Wolowacz, Classi, & Birt, 2012).

Ferrusi, Leighl, Kulin, and Marshall concluded that researchers of comparative research studies rarely estimate anything other than costs, and that looking at costs does not provide enough information for decision-making support due to the uncertainty involved (Ferrusi, Leighl, Kulin, & Marshall, 2011).

Applying just financial factors to healthcare decisions is problematic. Detsky, and Laupacis state that QALY should not be used alone for decision making. Cost Analysis research can only provide cost effective measurement information relative to an arbitrary threshold. In other words, utilizing multiple factors for decision making will maximize the benefits within an allocated budget, but more economically attractive options may get overlooked. Furthermore, the assumptions used in the analysis may be susceptible to error and bias (“Disease Management Update,” 2007).

Dalziel, Segal, and Mortimer found a number of different outcome measurements when they studied 245 health interventions. Outcomes included Life Year, QALY, and DALY. They concluded that each type of condition or modality needs to be judged on its own unique attributes; they cannot be grouped together with broad generalities. They looked at studies where the individual was able to reduce their own risk of disease or injury, or where a major cause of the condition was their own behavior (which includes almost all chronic diseases). They pointed out that these studies had a very low median incremental cost effectiveness ratio, where as diagnostic screenings, vaccinations, and mental disorders had the highest incremental cost-effectiveness ratio (Dalziel, Segal, & Mortimer, 2008).

Data from cost effectiveness studies cannot be accepted without being translated or adjusted for the country. Manca and Willan have proposed an algorithm that would help interpret the analysis for utilization in decision making or research in another country (Manca & Willan, 2006).

All of these issues with economic outcomes of health research means that, due to economic issues, the research does not always represent the actual underlying truth of the best treatments.

Another issue in cost analysis is: which costs are used? The base cost to provide the service? The cost to the patient? The cost to the insurance company? The cost to the government? The cost to society? For a single treatment, these may all be different amounts (deBrantes, Rastogi, & Soerensen, 2011; Newman & McMahon, 2011).

Tunis noted that the extent of cost benefit for any treatment or service is directly related to the choice of cost definition - which is not standardized. The study compared the estimates of a cost effectiveness results of two drugs using both the wholesale acquisition cost and the average wholesale price, and the cost effectiveness ratio went from .44 to 1.73, which would completely change the recommendation for treatment. The results were further complicated by the fact that there is not only a wholesale cost, but also a charged cost, an allowed cost, and a paid cost; often controlled by different parties (Tunis, 2009). Cutler and Marzilli found that the social cost of a resource was much different than the price. For example, the social cost of a new drug might be one-third the market price to insurance companies, and one-half the market price when paid for by one of the government healthcare options (Medicare or Medicaid) (Cutler & Marzilli Ericson, 2010; Gordon, 2012).
Prenger, Braakman-Jansen, Pieterse, der Palen, and Seydel found that behavioral intervention studies often do not include partial (though beneficial) changes. They discussed ways in which researchers could incorporate appropriate measures of partial change when reporting cost effectiveness of a treatment (Prenger, Braakman-Jansen, Pieterse, der Palen, & Seydel, 2012).

Peterson, Hollis, Pogge point out that cost benefits analysis incentivizes R&D for drugs of incremental or questionable value. The analysis provides greater returns on drugs that would be sold in high volumes, even if they did very little, while ignoring rare diseases or life saving drugs because they would only be sold in limited quantities (Peterson, Hollis, & Pogge, 2010).

Gemmill, Thomson, and Mossialos reviewed 173 studies regarding user charges (co-pays, co-insurance, deductibles, reference pricing, and formularies) on prescription drugs, which are purported to steer patients toward cost effective care. They found, however, that in practice they do lower the initial cost for healthcare but do not lead to long term control of pharmaceutical spending and do not contain total healthcare costs. They point out that providing harmful or ineffective commodities to those who are willing to pay is efficient, while providing effective and beneficial to those unable to pay is inefficient, a concept known as allocative efficiency (Gemmill, Thomson, & Mossialos, 2008).

Cost shifting is also an issue. There have been many attempts in legislation to lower costs using a variety of methods. Some researchers question the value of the different methods, claiming that sometimes savings at one level adds to costs at another level, i.e. cost shifting (Kaufman, 2011).

Roy and Madhavan reviewed 101 articles on Medicaid and Medicare policies on prescriptions drugs that solely focused on the costs of the drug themselves. Many of the studies revealed that when Medicare or Medicaid changed their policies in an attempt to rein in costs (for example, by restricting access through formularies or necessitating pre-authorization), they actually increased costs because patients had to visit their doctors to make the change - and the cost of the doctors visit would often wipe out the cost savings of the restriction (Roy & Madhavan, 2008).

Recent bills introduced in the legislature at the federal level incorporate the requirement of comparative effectiveness data, and there has been some research on the issue. Vernon, Golec, and Stevens warns that R&D costs for drug development will rise if additional comparative studies must be done in order to bring innovative treatments into the healthcare system (Vernon, Golec, & Stevens, 2010). Berger and Grainger from Eli Lilly, on the other hand, believe that comparative effectiveness analysis studies are the next step in evolving healthcare that will increase treatment options (Berger & Grainger, 2010). Like many other pharmaceutical companies, however, they are concerned that comparative effectiveness research will not be used as only one of many decision making point, but rather would dominate, causing cost-effectiveness guidelines to override healthcare decisions. Selker provides a good outline of this issue and describes guidelines for government agencies (such as keeping the policy making bodies and the research bodies separate). Selker advocates keeping the comparative effectiveness research scientific. Selker also believes that studies should be funded by the Agency for Health Quality Research rather than for-profit-industries (Selker, 2009).

Vos, et al, reviewed 339 studies of hospitals incorporating process improvement programs, and did not find much success. They identified three factors that hampered progress; 1) functional structure of the hospitals do not lend themselves to improvement,
2) unfamiliarity with proper process improvement techniques, and 3) the limited areas where streamlining could be useful. The authors advised hospital management to understand the factors for failure in the existing literature and to take them into account before attempting their own process improvements (Vos et al., 2011).

Practitioners might complain that cost cutting impacts quality. However, Moore, McMullen, Woolford, and Berger did not find that quality was related to cost when they studied the variations of clinical process in birth control facilities. They recommended that clinics adopt best practices, and decrease variability in order to lower costs (Moore, McMullen, Woolford, & Berger, 2010).

Another very important issue is how utilization impacts costs in healthcare. The number of people expected to utilize a diagnostic test or treatment relates directly to its cost. An MRI machine, for example, might cost one million dollars to purchase and maintain throughout its product lifecycle. If the hospital that purchases the MRI machine only has one person who needs an MRI assessment, the cost for that one MRI scan would be one million dollars. But if 100,000 people use it, the cost of each of the 100,000 MRIs is ten dollars. (It goes without saying that if they charge $1000 for each MRI, and 100,000 people use it, the hospital makes one hundred million dollars.) The Medical Expenditure Panel Survey published by the Agency for Healthcare Research and Quality measures utilization as one of its factors, and estimates its impact (though redesigns of the survey have minimized the quality of the estimates (Cohen, Ezzati-Rice, Zodet, Machlin, & Yu, 2011; "How safe is your hospital?", 2012).

CONCLUSIONS

A systematic review of the literature on economics and integrative health demonstrates that there has been a major upheaval in healthcare economics research. The review of the specific articles for themes seemed to fall under the following categories: Society, Ethical, Process, Payment, Custom, and Research.

Society Issues include the Rising Costs of Healthcare and the Growing Senior Population as well as the Growing Chronic Conditions and Diseases. Ethical issues include the Non-Economic Principles of Healthcare and the End of Life Care Management Issues. Process issues include the High Administrative Costs of Healthcare, Overtreatment and Waste, and Lack of Healthcare Information Technology Data Standards. Payment Issues are mainly impacted by the Multilayer Payment Structure of Healthcare in the United States. Custom Issues focus mostly on the Lack of High Quality Guidelines and Decisionmaking Methods. And finally, Research itself is an issue, with many impacts on the quality and source of research available for healthcare advocates including Healthcare Research Issues and Estimate Cost Benefits. Problems include the cost benefit methods themselves, the lack of ability to get any accurate costs because of the plethora of payment systems, the practice of cost shifting, and the impact of utilization and volume on costs.

In reviewing and describing the articles, their themes and categories, it appeared to the researchers that the bulk of the research shows support for the contention that economic issues can impact the quality of healthcare, and that some of these economic issues are interfering in high-quality healthcare – apart from the general issue that people with money can buy better healthcare than people without money. These economic issues seem to interfere with all healthcare – no matter what the source of healthcare funding. We suggest two rich avenues for further research.
One potential avenue to explore is what would happen if the incentives that trigger high incomes for some and high costs for others without generating health value to patients were to be abolished? Money doesn't disappear; it just shifts to the benefit of other parties. Tools to establish unjustified money-migration are often considered a feature of Clinical Economics, and additional studies in this topic are needed.

Another potential topic surrounds an as-yet-unexercised economic windfall in the United States which may be possible that could benefit society at large. The research hints at a huge amount of money that could be saved, while at the same time improving the quality of healthcare, by simply preventing rather than treating preventable diseases. We suggest that what is needed is an economic model to put more specific and supportable cost figures forward on how large a savings that might entail.

REFERENCES


Appendix A: List of Articles found in Systematic Search

Table 3, Table of Articles Found in Systematic Search

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PLAYING IT SAFE? AN ANALYSIS OF PROFIT VARIABILITY IN THE MODERN MOTION PICTURE INDUSTRY

M. Garrett Roth
Gannon University

ABSTRACT

This paper uses simple statistical analysis to determine whether the business of making motion pictures is becoming more or less risky over time. Contrary to popular perception, I find little indication that the variability of profits, as measured film-by-film, is decreasing over time and consistent evidence that variability is increasing after 1995. The results are robust to several definitions of what constitutes a “major” motion picture.

INTRODUCTION


The preceding quote captures the prevailing wisdom of both outside observers and Hollywood executives themselves. In a financial climate where Pirates of the Caribbean: On Stranger Tides commands a budget of over $378.5 million, the corporations behind major motion picture studios are most interested, it is said, in a return on investment that is guaranteed via sequels, prequels, reboots and remakes (hereafter, SPRR). However, little scholarly consideration has been given to the emergent empirical question: has this strategy been successful? That is, have major Hollywood films become less variable in their profitability due to this (perceived) risk aversion by studio executives?

This paper uses data from the-numbers.com and a simple econometric framework to address the issue. Although risk attitudes themselves are (obviously) unobservable, I look at the financial variability of “major” Hollywood films and find, if anything, an upward trend in the variability of motion picture profitability after 1995. Thus, despite what may be the best efforts of executives to minimize risk, the profits to motion pictures are no better assured at present than they were in 1980. The relevant trends do depend on the particular time-span considered, but are almost never significantly downward (toward less variability) and consistently upward after 1995, where available data is most comprehensive.

An expectation of SPRR’s guaranteeing normal rates of return at minimal risk seems an obvious conclusion from casual observation. Superhero films (largely composed of sequels or reboots) demonstrated the highest average profitability of any genre in 2017 (Van

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6 See the online supplement to DiPersio (2001) for the full quote by Bart.
7 Peter Bart’s sentiment is echoed by similar statements from studio executive Lucy Fisher and film critic Elvis Mitchell (DiPersio, 2001).
8 “Financial variability” is subsequently defined as percent profit over cost as measured by international gross theatre receipts.
Heertum, 2017). The (superhero) sequel, Avengers: Endgame, for example, is predicted to be the highest grossing film of 2019 (Wood, 2019). It also appears that a TV-to-film evolution (as a form of remake / sequel) is increasingly popular (Van Heertum, 2017). But for every Incredibles II, with 102% increase in gross over the original film, there is a Lone Ranger reboot with $127 million in losses (The-numbers.com, 2019). Consequently, determining a general fiscal trend requires thorough analysis rather than anecdotal observation. To the best knowledge of the author, no scholarly research of a comprehensive empirical nature currently exists.9 The previously cited blog post of Rich Van Heertum (2017) provides a statistical departure point via summary data, but draws no firm conclusions.

Accordingly, this paper takes the simplest of econometric strategies; I measure dispersion in percent profit for varyingly generous definitions of “major” motion picture and regress these figures against a time trend. Because data drawn from the-numbers.com is nearly comprehensive since 1996, and because the same data is almost non-existent before 1980, I use timelines of 1996-2018 and 1980-2018 to be, alternatingly, robust and far-sighted. The results are largely consistent; the medium-term trend (since 1996) was toward increased variance with no clear evidence of a long-term trend. Thus, whatever perceptions of the motion industry continue to persist, the business of financing movies, on an individual basis, has not become less risky over time.

EMPIRICAL EVIDENCE

The data I employ come from the-numbers.com, a website that has compiled financial statistics for both U.S. and international films since 1997. The database most pertinent to my investigation includes approximately 5,700 films and provides an actual or well-estimated production cost, domestic box office revenue, and international box office revenue.10 Though individual film listings date to the beginnings of the film industry in the U.S., comprehensive data collection begins in 1996.11 Bear in mind that only 136 films released in 2017 had production budgets exceeding $1 million; thus, the data compiled since 1996 can be loosely regarded as that of the actual population of interest rather than merely a

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9 Previous (non-academic) studies of Hollywood financial trends have focused on the profitability and prevalence of female roles in general and protagonists in particular, e.g. Johanson (2016).

10 While home video sales (for which no comprehensive data is available) will doubtlessly supplement theatre-based revenues to a degree, their omission will not meaningfully affect my results because (i) home video sales and rental markets (when including movies-on-demand) have not expanded or contracted significantly since 1996 and (ii) home video revenues should, regardless, be in rough proportion to box office revenues. As a consequence, omitting home video revenue may understate the relative profitability of successful movies and overstate the relative profitability of unsuccessful movies in a given year (and generally increase all yearly variances), but should not affect the change in variance of profitability over time.

11 To maximize historical perspective, I report statistics where n > 20 (thus, beginning with 1980). These earlier results should, however, be taken with an appropriate dose of salt. Accordingly, I consider separately the prospective trends across the full timeline and a more restricted timeline beginning at 1996.
sample thereof. I restrict my attention to “major” motion pictures, initially defined as those whose production cost equals or exceeds $1 million in real terms.\textsuperscript{12}

Quantifying risk attitudes as one would in an experimental setting is not possible here, as I can only observe the cinematic “gambles” that \textit{were} taken by film studios and not the projects that were passed up as undesirable. With this caveat in mind, my analytical method is straightforward: I simply calculate the standard deviation on profitability across all films released in a given year. I define “profitability” as international profit (revenue less production cost) as a percentage of total production cost, where “international” includes all U.S. box office receipts.\textsuperscript{13} Table 1 provides these statistics.

**Table 1 about here.**

No clear pattern is visible per the standard deviation values given in Table 1. To better examine any trends over time, I plotted these values as shown in Figure 1. The solid gray line is a plot of standard deviation and the dashed black line is a plot of gross revenue over production cost. Clearly, no downward trend in standard deviation (indicating increased risk aversion and tighter profit distributions) is present. Moreover, where data is most plentiful, after 1996, the general trend seems to be upward, toward greater variation in returns on film projects!

**Figure 1 about here.**

A more rigorous analysis confirms the cursory observations drawn from Figure 1. A standard ordinary least squares (OLS) regression, with percent change in real GDP added as control variable, is reported in column i of Table 2.\textsuperscript{14} The result confirms that no clear trend exists over the full time period ($p = 0.188$). However, where data are more comprehensive (after 1995), a significant upward trend ($p < 0.001$) is present as reported in column i of Table 2.2. Thus, with the best available data, I can confirm that film production, as a reflection of the decisions made by studio executives, is becoming more risky rather than less.\textsuperscript{15}

\begin{footnotesize}
\begin{enumerate}
\item Nominal production cost was adjusted via the GDP deflator per Federal Reserve Economic Data. There is no deliberate selection criteria employed by \textit{the-numbers.com}, and my population restriction serves to eliminate minor, independent films as well as many foreign films produced outside of the purview of Hollywood. I also suspect that many of the independent and low-budget films listed (e.g. \textit{Clerks}) are included precisely \textit{because} of their unexpectedly high profitability, whereas low-budget, low-revenue films typically fly entirely “under the radar” of the website. Thus, eliminating these financial outliers actually strengthens the accuracy of the analysis.

\item I focus on international financial figures as an obviously more comprehensive depiction of realized revenues for a given film project. Also, given that a non-trivial number of films in the dataset are internationally produced and oriented, gauging their success by U.S. revenues alone would be a serious underestimate of their profitability.

\item Percent change in real GDP comes from Federal Reserve Economic Data (Bureau of Economic Analysis, 2019).

\item As a robustness check, the regressions reported in Tables 2.1 and 2.2 were also performed with absolute deviation from mean (rather than standard deviation) as the
\end{enumerate}
\end{footnotesize}
My initial benchmark for what constitutes a “major” film project (a production cost at or above $1 million) was deliberately conservative so as to maximize the size of the qualifying population, given an industry with low output relative to other forms of media and consumer products. One might appropriately question, however, whether $1 million dollars is too low a bar to qualify as “major” and that, moreover, studio executives are increasingly risk averse, but only as pertains to big-budget motion pictures. Accordingly, as a robustness check, the data were further restricted to films with real production costs of at or above $10, $30, and $50 million. The sample size for each restriction is reported in the Appendix Table A1. A corresponding regression of standard deviation on year is reported in columns ii, iii, and iv, respectively, of Tables 2.1 and 2.2. With the exception of a marginally significant downward trend in the $10 million plus category of the full timespan, the alternative specifications reproduced the same trends as in the least restricted population previously discussed; no significant trend exists in the value of standard deviation over the full timeline (1980-2017) and a significant upward trend exists in the narrower timeline (1996-2017). Thus, one may conclude with some certainty that the variance of profitability within the film industry is non-decreasing and potentially increasing over time.

CONCLUSION

The most comprehensive data available suggests that, casual appearances aside, the motion picture business is not becoming a safer industry in which to earn a normal profit. If movie producers are becoming more risk averse, audiences in turn may be simultaneously becoming more fickle. Conversely, executives may be wearing old stories so thin that audiences are simply fatigued with SPRR in general (thereby inverting the premise of their box office reliability). Excessive confidence in the widespread marketability of known franchises (e.g. the Indiana Jones series) may also mean correspondingly poor output when over-extended. Video games may have become an increasingly high quality and low cost substitute for movie-going. While there is no obvious statistical means by which to disentangle these distinct (but non-rivalrous) explanations of the empirical results, the previous analysis sets a marker upon which future research can expand.

dependent variable with no meaningful change in outcome. These additional results are omitted for the sake of brevity.

16 An earlier draft of this paper also considered an $80 million plus category. However, so few films in a given year command budgets of this magnitude that this restriction was discarded due to insufficient population size. Under this specification, the 1996-2017 period (where population size was small but consistently non-zero) showed no significant time trend in financial variability.

17 Omitting percent change in real GDP from the regression specification renders all coefficients in the full timespan statistically insignificant but does not alter the consistently high significance of the time trend in the restricted timespan. This adds credence to the supposition that the marginally significant but negative coefficient in column ii of Table 2.1 is a statistical fluke.
APPENDIX

Table A1: Sample Size by Budget Category

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**REFERENCES**


### TABLES AND FIGURES FOR BODY OF PAPER

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Figure 1 Time Trends of Profitability Statistics
### Table 2.1 Standard Deviation in Profitability, 1980-2017

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<td>Constant</td>
<td>-70.29 (56.23)</td>
<td>67.34* (35.20)</td>
<td>39.37* (22.56)</td>
<td>-24.44 (24.28)</td>
</tr>
</tbody>
</table>

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Table 2.2 Standard Deviation in Profitability, 1996-2017

<table>
<thead>
<tr>
<th>Dependent variable: s.d. in profitability</th>
<th>(i) $1 million plus budget</th>
<th>(ii) $10 million plus budget</th>
<th>(iii) $30 million plus budget</th>
<th>(iv) $50 million plus budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>0.243***</td>
<td>0.0891***</td>
<td>0.0603***</td>
<td>0.0527***</td>
</tr>
<tr>
<td></td>
<td>(0.0529)</td>
<td>(0.0206)</td>
<td>(0.0136)</td>
<td>(0.0118)</td>
</tr>
<tr>
<td>GDP (% change)</td>
<td>0.486**</td>
<td>0.0807</td>
<td>0.00721</td>
<td>0.0128</td>
</tr>
<tr>
<td></td>
<td>(0.207)</td>
<td>(0.0805)</td>
<td>(0.0530)</td>
<td>(0.0461)</td>
</tr>
<tr>
<td>Constant</td>
<td>-484.9***</td>
<td>-176.5***</td>
<td>-119.1***</td>
<td>-103.8***</td>
</tr>
<tr>
<td></td>
<td>(106.3)</td>
<td>(41.39)</td>
<td>(27.28)</td>
<td>(23.69)</td>
</tr>
</tbody>
</table>

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1
AL-UMRAN: IBN-KHALDUN’S THEORY OF DEVELOPMENT

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ABSTRACT

Ibn-Khaldun is an eminent figure in the Arab World. Born in Tunisia (1332), he witnessed the “free fall” of the Arab civilization which sparked his curiosity to seek an answer to one of the most pertinent questions of all time: what would make a civilization which once was a symbol of knowledge creation and development to decline and lose the leadership role it has assumed for centuries?

He identifies, the use of force (dictatorship) and luxury indulgence by the ruler as the main causes leading to the fall of the Arab civilization.

INTRODUCTION

Ibn-Khaldun is an eminent figure in the Arab World. He was born in Tunisia (1332) to a noble family and received the best education of his time. His book Al-Muqaddimah (Prolegomenon) which was qualified as “The greatest work of its kind that has ever been created by any mind in any time or place” (Toynbee, 1935, p. 322); is a testament to his extensive knowledge, analytical skills and intelligence.

Six centuries ago, Ibn-Khaldun was a witness of the “free fall” of the Arab world: internal conflicts, political dictatorship, poor economic performance, corrupt administration, extreme poverty, health diseases, unequal distribution of wealth and injustice. These shocking conditions made him so determined to seek an answer to the most pertinent question of his time: what would make a civilization which once was a symbol of knowledge creation and development to decline in such a manner and lose the leadership role it assumed for centuries?

His answer to the above question was not a mere statement, a political speech or an elegant lecture. He knew that such a complex issue requires a critical analysis of the interplay of social, political, historical, economic and cultural factors over a long period of time. To that end he dedicated a whole book (Al-Muqaddimah) in which he claims to have set up the foundation of “an entirely original science” (R:39) which he named Al-Umran (Civilization). Ibn-Khaldun defines Al-Umran as a natural disposition of human beings to “settle together in cities and hamlets for the comforts of companionship and for the satisfaction of human needs” (R:43). As rightly pointed out by Al-Araki (2006), Al-Umran both denotes the idea of inhabiting a habitat (human social organization) and that of prosperity (growth and development). It is a dynamic concept that goes beyond a simple documentation of the events leading to the fall of the Arab World and its civilization. It is rich enough to outline the trajectory of civilizations and identify major factors that cause
them to form, grow, reach their peak, weaken, deteriorate and eventually disintegrate. Ibn-Khaldun praises God for his guidance “in presenting the problems of (this science) exhaustively” and praises himself for addressing a topic that is “new, extraordinary and highly useful” (R:39).

Given its originality and multidisciplinary nature, Al-Muqaddimah, has been subjected to extensive analyses and interpretations both by Arab and Western scholars. Most of these studies seek to understand Ibn-Khaldun’s thoughts and ideas in fields as diverse as social sciences, demography, education, economics, politics and history to name a few. Surprisingly, studies addressing Ibn-Khaldun’s development ideas are almost inexistent. This is rather puzzling knowing that Al-Umran, which in modern terms, means prosperity and development is the center piece of Al-Muqaddimah.

It is not clear why such a rich concept received very little attention by development economists in general and Arab scholars in particular. To the author’s knowledge, the first attempt to propose Ibn-Khaldun’s development model is Chapra’s (2008) article titled: Ibn-Khaldun’s theory of development: Does it help explain the low performance of the present-day Muslim world? Chapra’s deep understanding of the Khaldunian thinking coupled with his familiarity with mainstream development literature and awareness of current development issues; allowed him to present 14th century ideas using modern concepts and vocabulary. Subsequent efforts in this area are very limited and are all indebted to Chapra’s original article with little or no added value. This makes Chapra’s work not only the first but, perhaps, the only attempt to present Ibn-Khaldun’s development thoughts using the eight principles of political wisdom.

THE EIGHT PRINCIPLES OF POLITICAL WISDOM

Chapra’s model was entirely build on the eight principles of political wisdom (hereafter, 8-PPW), reported by Ibn-Khaldun in Al-Muqaddimah. The 8-PPW consists of eight precious advices by the sages of mankind to rulers on how best to manage their state affairs if they wish to bring about peace, prosperity, growth and development (see figure 1). It runs:

- king, the might of royal authority materializes only through the religious law (S).
- The religious law persists only through royal authority (G).
- Mighty royal authority is accomplished only through men (N).
- Men persist only with the help of property (W).
- The only way to property is through cultivation (g).
- The only way to cultivation is through justice (J).
- Justice is a balance set up among mankind.
- The Lord set it up and appointed an overseer for it, and that (overseer) is the ruler.

According to Chapra, the 8-PPW links important socio-economic and political variables such as political authority (G), beliefs and rules of behavior or the Shariah (S), people (N), wealth or stock of resources (W), development (g) and justice (j), in a circular manner, each influencing the others and in turn being influenced by them (Chapra, 2008, p.4). He further explains that the way the above factors interact with and react to each other, determines whether the civilization will rise (development) or fall (decline). This, he continues, happens when one (anyone) of the factors act as a trigger element and affects others through a chain-reaction fashion. Depending on the nature of the trigger element and its direction (positive or negative), civilization will either rise (development) or fall (decline).
Despite its popularity, Chapra’s suggested model suffers from a number of weaknesses that make its attribution to Ibn-Khaldun questionable. First, it completely ignores the fundamental role of the state. Second, the circular nature of the 8-PPW gives equal importance to all factors, while Ibn-Khaldun considers Asabiyah (group feeling) and money main the pillars of development. Third, any factor could trigger the decline of society, while Ibn-Khaldun clearly chose injustice as the main trigger of decline.

This article offers a new interpretation of Ibn-Khaldun’s development model, that is totally different from the eight principles of political wisdom (8-PPW) framework adopted by Chapra. Taking a fresh look at Al-Muqaddimah without prior restrictions such as those imposed by the 8-PPW; helps avoid the problems mentioned above and build an authentic model that best reflects Ibn-Khaldun’s development thoughts.

The author is conscious of the challenges as well as the limitations of interpreting classic texts such as Al-Muqaddimah. The book is written in highly sophisticated Arabic language, introduces a new science (Al-Umran), uses a series of new concepts (Group feeling, state, etc.) and follows an unusual structure5. Very often themes are not captured under specific chapters, sections or headings, but rather spread throughout the book. Recollecting, restructuring and analyzing these scattered ideas is a delicate exercise which requires a great deal of diligence. It is, therefore, not surprising to see Ibn-Khaldun’s work subject to different viewpoints and very often conflicting analyses and interpretations. And this is more likely to happen when exploring ideas and issues, such as development, which have received much less attention.

To be true to Ibn-Khaldun’s thinking and intent is not easy. While some degree of subjectivity is inevitable, great effort is made –by the author- to rely as much as possible on explicit statements which leave little room for conflicting interpretations.

STATE AND DEVELOPMENT: A SOUL-BODY RELATIONSHIP

The notion of Dawla, which means state in Arabic is an essential pillar of the Khaldunian thinking. Despite the extensive use of the word Dawla in the Muqaddimah; Ibn-Khaldun does not provide a clear definition of what Dawla exactly means. While he often uses it to refer to the political entity (state), it has also been used as synonymous with royal authority (Mulk) or ruler (Sultan) (Aziz 1977). In his translation of the Muqaddimah, Rosenthal prefers the word “Dynasty” instead. Therefore, the terms, dynasty, ruler, royal authority and state shall be used interchangeably.

The state is so important that Ibn-Khaldun dedicated a substantial part of his book to it. It derives its importance from the role it plays in human social organization, which, according to Ibn-Khaldun is a necessary condition for development to take place. Having people live together in order to cooperate and enjoy a prosperous life would not be sustained unless there is an authority that can prevent people from transgressing each other’s boundaries and rights. That authority is simply the state, which is tasked to protect human social organization from various external as well as internal threats.

At the external level it protects people from invaders and ensures the security of its territory. Internally, it is responsible for managing political, social, religious and economic affairs. The state is also responsible to defend people and their property from transgressors and secure the caravan routes from criminals and bandits, in order to facilitates the movement of people and merchandise between cities and as well as between nations.
After this brief account of the importance of the state, one would think that Ibn-Khaldun is an advocate of a developmental state (Leftwich, 1995) which intervenes heavily in the social, political and economic affairs as a way to achieve its development objectives. This is not really the case. The state in the Khaldunian thinking is more than a locomotive for development; it is so important that it has become synonymous with development itself:

Dynasty and royal authority have the same relationship to civilization as form has to matter... One cannot imagine a dynasty without civilization, while a civilization without dynasty and royal authority is impossible.... Since the two cannot be separated, the disintegration of one of them must influence the other, just as its non-existence would entail the non-existence of the other (R:289).

State and development have a soul-body relationship which makes them inseparable from each other. The special relationship state has with development is well established in Al-Muqaddimah. He has been very consistent in using these two concepts (state and development) interchangeably, especially when he refers to the fall of civilization. For example, what Ibn-Khaldun means when he says: “The dynasty shows symptoms of dissolution and disintegration….and finally dies” (R:135), is not just the death of the dynasty but rather the death of civilization (development) itself.

Unfortunately, this special status of the state has been totally overlooked by the 8-PPW model. The failure to comprehend the unique relationship that exists between development and state, is likely to lead to incomplete, if not wrong, interpretations of Ibn-Khaldun’s development thoughts.

PILLARS OF DEVELOPMENT

A quick look at Al-Muqaddimah’s table of content would make a heading “How disintegration befalls dynasties” (R:246) clearly visible to the reader. In this section, Ibn-Khaldun introduces the two layers of the building blocks of his development model. The first layer is the foundation of development which consists of Asabiyah and money. The second layer comprises two agents of destruction, luxury and force, which are a direct threat to the two foundation of development.

We shall first address the pillars of development, money and Asabiyah, and then turn to the two destructive factors of these pillars force and luxury.

First Pillar: Asabiyah

Asabiyah, widely translated as group feeling or social cohesion, is a pillar of the state and a necessary condition for human social organization. Without it civilization cannot be formed and sustained (R:199). Besides its social meanings, which manifest in social order, solidarity and unity of the social fabric; Asabiyah has a strong political connotation. Ibn-Khaldun has argued that the ultimate goal of group feeling is nothing but royal authority (R:107). In modern terms, this could be seen as a combination of political and military power. That is why Asabiyah has always been associated with the constant struggle for power among various tribes and communities. The tribe that has the capacity to mobilize a larger number of followers and supporters (strong Asabiyah), takes charge of the state affairs by appointing a ruler and firmly establishing its supremacy. This, according to Ibn-Khaldun, is necessary
in order to establish social order and protect people and their properties from internal as well as external aggression.

Ibn-Khaldun’s advocacy for a strong Asabiyah is informed by his conviction that man has an “animal character” which makes him predisposed to engage in hostile actions against others. When people’s life is threatened and their property not protected, they lose all incentives to engage in productive activities which weakens the state and eventually leads to the fall of civilization. The absence of an authority that prevents people from transgressing each other’s rights, creates a state of anarchy which “destroys mankind and ruins civilization” (R:118). To safeguard people’s lives and property, the ruler should have enough power to impose order and the rule of law.

In other terms, Ibn-Khaldun considers stability of the state the first condition for development to take place. A state in which people feel safe, their property protected and are fairly treated before the law, creates favorable conditions for business to thrive and the economy to grow.

Second Pillar: Money

Ibn-Khaldun considers Asabiyah necessary but not sufficient for the formation of a sustainable state. To withstand internal as well as external threats and execute its plans and perform its duties; the state needs effective institutions, which require enormous amount of money.

During his time, the army was, perhaps, the most important institution of all. Keeping the state safe from the constant threat of internal coups and defending its territories from potential invaders and enemies is a matter of to be or not to be. Therefore, making it a top priority. However, besides the army which is responsible for the safety of the state, a number of other institutions are also responsible for serving public interest and promoting the wellbeing of its subjects through its various offices (R:170-180). The office of market (hisbah) monitors the market to ensure it is free from cheating, theft, manipulation or any kind of abuse that would prevent the market from functioning properly. The office of mint issues currency and ensures its authenticity. The police are responsible for preventing crimes (R:175), and securing the caravan routes from criminals and bandits as this facilitate the movement of people and merchandise between the cities, which in turn helps stimulate trade and business. The office of judge is responsible for settling disputes and promoting fair and equal treatment of people before the law (R:172-173).

Royal authority, through its army and other institutions, is without doubt an important pillar of the state; but it is money that “supports the soldiers and provides the whole structure needed by royal authority” (R:246). This is because money, which in modern terms could be seen as economic power, is vital for the proper functioning of the institutions which constitute the backbone of development and growth. Without money, institutions would not be able to perform their duties effectively, eventually leading to the disintegration of the state and decline of civilization.

To Ibn-Khaldun, development must rest on two important pillars: a strong political power (Asabiyah) and a strong economic power (money). Anything that weakens these two foundations will lead the disintegration of the state and the fall of civilization.

DESTRUCTIVE AGENTS OF DEVELOPMENT
Civilizations have a natural life span (R:136). Like individuals they go through various (five) stages before they grow die and collapse (R:141-142). Life of the dynasty depends on the strength of its foundations to withstand the impact of two destructive agents: luxury and force (R:246). In the section “How Disintegration Befalls Dynasties”, Ibn-Khaldun identifies luxury and force as the two important factors contributing to the disintegration of the dynasty. Force destroys the first pillar of development which is Asabiyah; whereas luxury destroys both asabiyah and money. While the use of the term force is quite clear, the word luxury requires some clarification. A careful examination of the section content shows that the term luxury means luxury deprivation of the rulers’ opponents when used as a destructive agent for Asabiyah, and luxury indulgence of the ruler and his entourage when used as a destructive agent for money. Therefore, to be more precise, the expression “luxury deprivation” and “luxury indulgence” shall be adopted instead of the single ambiguous term luxury.

**Force and Luxury Deprivation**

Ibn-Khaldun discusses force and luxury deprivation as destructive agents of asabiyah in a specific context of power struggle among the leaders. The use of force by the ruler against his subjects, has been treated in a separate section under the broader heading of injustice (We shall discuss this shortly). After stressing the importance of Asabiyah as an important pillar of civilization, Ibn-Khaldun points to force and luxury deprivation as major threats surrounding it.

The obsession with power which characterizes Arab societies, and the fierce battles that take place among the leaders, make the road to the palace paved with bloodshed and terror. The only way for a ruler to establish his authority is to declare war against all potential competitors who might challenge his rule or contest his legitimacy. He eliminates all “his relatives who are possible candidates for his position and whom he suspects (R:244). He “claims all the glory for himself and does not permit the people to share in it (R:132). He exercises power without limits, dominates all aspects of life and holds divine-like authority (R:132). To further humiliate his opponents, especially members of his family and relatives, he deprives them from the luxury (thus the term luxury deprivation) and prosperity they were used to (R:246), seize their property and takes away all privileges to which they are entitled.

The ruler who makes such short-sighted decisions, fails to realize that the victims are not ordinary people but great leaders who have contributed to the formation and growth of the state. Individuals who possess such leadership qualities are rare (R:95). The implications of such brutal repression of his political opponents are costly not only to his reign, as a person, but to the state as a whole. Having lost their leaders, tribes are no longer willing to stand by the ruler to defend him (and the state) against invaders. They, in fact, look for any opportunity to take revenge and kill him.

Ibn-Khaldun was convinced that political stability is a necessary condition for the state to effectively perform its duties and achieve its developmental objectives. However, he was also aware that ruler’s reliance on force and luxury deprivation to silence his political opponents and retain power triggers an endless cycle of violence and coups d'état which divides society and weakens Asabiyah as well as the state. It then becomes a matter of time before the dynasty falls apart and civilization is ruined (R:250,133).

It is important to note that despite Ibn-Khaldun’s emphasis on strong asabiyah (political power) as a pillar of development, he was strictly against defending, supporting or legitimizing authoritarianism. Ruler’s authority is only as good as the objectives he intends
to achieve: “If such ruler-ship is good and beneficial, it will serve the interests of the subjects; If it is bad and unfair, it will be harmful to them and cause their destruction”.

Luxury Indulgence

According to Ibn-Khaldun, “royal authority by its very nature requires luxury” (R:134). This strong association luxury has with royal authority, makes it a significant theme in Al-Muqaddimah, to the extent that it has been recognized as a fundamental cause of the fall of civilization.

Luxury indulgence impacts civilization through the pillar of Money. Its impact, however depends on dynasty’s evolution. At its early stages, luxury indulgence accelerates the process of development and provides the state with additional strength since it helps extend the size of the ruler’s family and win the support of many followers (R:232). However, as it grows older, luxury indulgence becomes a curse rather than a blessing and causes its fall and disintegration. The negative implications of luxury indulgence start to manifest after the third stage of the dynasty. Once the ruler has secured his position as the only and uncontested leader of the state; he then turns to take full control of its wealth. He shares it with his inner circle who “compete with each other in matters of food, clothing, large palaces, good weapons, and the horses in their stables” (R:250). To make things worse, each generation tries to surpass the previous one in this respect (R:133).

This extravagant expenditure of the elite spreads to soldiers, government servants and to the subjects (people) both in urban and rural areas (R:249). Luxury becomes a way of life (R:250) which has to be constantly met with an increase in soldiers’ allowances and salaries of government employees. When revenue falls short of the expenditure and the dynasty fails to meet the ever increasing demands of the ruler, his entourage and his soldiers; he (the ruler) introduces a number of measures to remedy the situation. Unfortunately, as we shall see shortly, these actions would only worsen the situation and eventually lead the fall of the state and the ruin of civilization.

Tax increase:

The easiest and perhaps the fastest—but not necessarily the best—measure for the ruler to maintain such a luxurious lifestyle, is to increase taxes with the hope that this will lead to an increase in revenue. To improve budget position, the ruler focuses only on means to increase tax revenue (income side) and not on ways to reduce expenses on his personal extravagant lifestyle (expense side). In fact, his ever increasing luxury needs have to be met with multiple increase in tax rate (R:230), until such high tax burden acts as a disincentive for people to engage in productive activities, forcing many of them to exit the market. This eventually leads to lower tax revenue (R:356), which, in turn, induces a new cycle of tax increase until the tax burden becomes intolerable and cultural enterprise totally disappears. As a result, the state suffers severe shortage of goods and services, higher bankruptcies and unemployment, food insecurity, waste of resources which affect the overall wellbeing of the people and ultimately leads to the destruction of civilization (R:231).

The decrease in government revenue also affects the proper functioning of vital institutions, such as the police, the court system and the army. The latter is the most serious threat to the dynasty since the lack of tax revenue to pay for soldiers’ allowances reduces
their number and weakens Asbaiyah (R:133-34). Hence, luxury indulgence which has a strong direct effect on money (tax revenue), also has an indirect effect on Asbiyah, posing a serious threat to both pillars of development.

Ibn-Khaldun understood the effect of tax rate on tax revenue long before economist Arthur Betz Laffer (2004) had formally represented this relationship in what has become known as Laffer Curve. Therefore, according to Ibn-Khaldun, the best way to increase tax revenue is to encourage productive activities and “the strongest incentive for cultural activity is to lower as much as possible the amounts of individual imposts” (R:231).

In the section titled “Ruler’s involvement in Business”

When fiscal pressure escalates, the ruler realizes that imposing higher tax rates doesn’t help overcome the problem. Desperate to get extra revenue that would allow him to sustain his luxurious life style; he engages in trade and business, and becomes a major market player. He believes that this should be profitable to him just as it is to other traders. Armed with absolute authority, he seizes people’s products or buys them extremely cheap and resells them for much higher prices (R:232-33). This unlawful exercise of power, eventually forces traders and merchants to go out of business since they lose all incentives to engage in production and wealth creation activities.

The decision to exit the market causes harm not only to farmers and merchants, but also to the dynasty which experiences a further reduction in tax revenue as most of it comes from the taxes levied on those businesses. As for the ruler, despite making profit, his overall revenue decreases as the loss from tax revenue far outweighs the profit he generates through unfair business dealings (R:234).

Despite giving the state a very special status and a great deal of power, Ibn-Khaldun was strictly against the abuse and misuse of power by the ruler and his intervention in the market. Using his authority to engage in an unfair competition, would push merchants and traders out of business and causes the disintegration of the dynasty and the destruction of civilization (R:234).

INJUSTICE TRIGGERS THE RUIN OF CIVILIZATION

This is a title of a section in Al-Muqaddimah. Although, as presented above, Ibn-Khaldun has identified and thoroughly analyzed pillars of development and the factors threatening them; he considers injustice the main factor that triggers the ruin of civilization. All major threats to civilization are in fact nothing but a manifestation of a deeper problem which is: injustice.

Injustice, according to Ibn-Khaldun, is a broad concept that covers all aspects of life, including, political, social and economic relationships. Taking someone’s money or property, imposing unjustified taxes, denying people’s rights, forcing workers against their will, infringing property rights, imposing a duty not required by law (R:241), misusing authority (R:157) are all instances of committing an act of injustice.

A society in which injustice is prevalent discourages people from acquiring property, since it will be taken away from them by the powerful and have no chance of getting it back. When the safety of people and their property is threatened, those engaged in gainful activities such as, peddlers, shopkeepers, craftsmen, and traders lose all incentives to sustain their activities and are left with no option but to go out of business. This situation which directly
affects the livelihood of the people, leads to a great deterioration in tax revenue and the fall of civilization as explained earlier.

It is for these reasons that Ibn-Khaldun, who was a chief judge himself, fought a war that lasted decades against corrupt judges, muftis and Imams; who hijacked the court system in order to serve and protect the interests of the elite, the rich and the powerful. Determined to restore order in the court, he “spared no efforts to apply impartially the law of God” and to make sure the rule of law prevails and justice is served.

CONCLUSION

No state no development. This is perhaps the best way to summarize Ibn-Khaldun’s development model. State is so important to development to the point where the two become inseparable. This soul-body relationship implies that a state that is politically and economically strong should lead to development, growth and prosperity of the people. However, political strength does not mean in any way silencing and killing political opponents and activists in order to maintain ruler’s authoritative regime. And economic strength does not give the ruler the right to use tax revenues to fulfil his personal desires and luxurious lifestyle at the expense of the people and their wellbeing. Despite the historical prevalence of strong-man rule in the Arab world; Ibn-Khaldun was categorically against such regimes in which the ruler and his entourage have absolute power to plunder as they wish. Abuse of authority and misuse of public funds, are two major factors that weaken the state and destroy civilization.

As a fervent advocate of a strong state, Ibn-Khaldun makes a clear difference between a strong state and a strong ruler. He insists that exercise of power should be governed by the principles of justice and the rule of law and not by the desires and interests of the powerful. Justice, in the Khaldunian thinking, is the oxygen (heart) of development. When injustice prevails, the state collapses and civilizations is ruined.

Concepts such as developmental authoritarianism, in which development is achieved through an authoritarian regime, goes against Ibn-Khaldun’s model in which justice is a precondition for development to take place. This is at least true in the context of the Arab world, where dictatorships have brought nothing but poverty, high unemployment, war, ignorance and disasters.

When Ibn-Khaldun wrote his book, Al-Muqaddimah, to identify and understand major factors contributing to the fall of the Arab civilization; he was not probably aware that six centuries down the road, his development model would still be relevant and able to explain the bitter reality of developing countries in general and the Arab world in particular.

The use of force and indulgence in luxury, which are the two most destructive agent of development, are typical characteristics of all Arab current regimes. The 2011 Arab Spring was a revolt against some of the most ferocious dictators in the world. It led to the removal of four powerful rulers: Zine El-Abidine Ben Ali who ruled Tunisia for 23 years, Hosni Mubarak (Egypt, 30 years), Muamar Al-Qaddafi (Libya, 42 years) and Ali Abdullah Saleh (Yemen, 33 years). The second wave of the Arab Spring (early 2019) also brought down two more dictators: Abdel Aziz Bouteflika (Algeria, 20 years) and Omar Hassan Al-Bashir (Sudan, 26 years).

Arab rulers in general are known not only for their brutality (excessive use of force) against their people, especially the dissent; but also for being highly corrupt and using public funds to enrich themselves, their families and their cronies. Money that should be used to
build basic infrastructure, such as schools, hospitals and roads, which are necessary for development; is spent on the pleasures of the ruler and his entourage. No wonder, development goals are out of reach for many Arab societies.

ENDNOTES

1. Al-Muqaddimah was translated into English in three volumes by Franz Rosenthal. Its first edition was published in 1958. The one used in this article is the translation by Rosenthal, abridged and edited by N. J. Dawood, with an introduction by B. Lawrence (2015). Throughout the manuscript we shall refer to this edition using R (for Rosenthal).
2. He says: In fact, I have not come across a discussion along these lines by anyone. I do not know if this is because people have been unaware of it, but there is no reason to suspect them (of having been unaware of it). Perhaps they have written exhaustively on this topic, and their work did not reach us (R:39)
4. Chapra interprets S as institutions and rules of conduct which regulate people’s behavior
5. Perhaps that’s what he meant when he says “I followed an unusual method of arrangement and division into chapters”.
6. Asabiyyah is an important concept in Al-Muqaddimah without which Ibn-Khaldun’s thoughts cannot be understood.
7. Under the rule of (the Arabs), the subjects live as in a state of anarchy, without law. Anarchy destroys mankind and ruins civilization (p.199).
8. Mainly its first and second stage (R:233)
9. Although Ibn-Khaldun has not been given due credit for his contribution to many economic ideas, this time Laffer himself whose great work on taxation has shaped the economic thinking and policies in the united states especially during the Reagan administration; gives full credit to Ibn-Khaldun for being the first to recognize the effect of taxes on tax revenue: “The Laffer Curve, by the way, was not invented by me” (Laffer, 2004).

REFERENCES


Figure 1: Ibn-Khaldun Development Model (Chapra, 2008)
THE EXTERNAL DEBT AND ITS IMPACT ON ECONOMIC GROWTH AND INVESTMENT IN ECOWAS COUNTRIES

Kalamogo Coulibaly
Overseas Private Investment Corporation

Yaya Sissoko
Indiana University of Pennsylvania

Brian W. Sloboda
University of Phoenix

ABSTRACT

Debt level has increased in most African countries in recent years; furthermore, in some countries at a worrisome pace. But the continent is not yet experiencing a systemic risk of debt crisis. On a regional level, several countries in Economic Community of West African States (ECOWAS) experienced major episodes of financial crisis that were characterized by unsustainable fiscal deficits after several decades after independence. During this period, however, current account deficits were considered normal. Therefore, ECOWAS countries were encouraged to borrow from abroad to finance their deficits and to create a conducive environment that attracts foreign investment to boost economic growth. Meanwhile, little attention was paid to the individual countries’ absorptive capacities and ability to repay the borrowed funds. Suma (2007) posited that external funding has been crucial in developmental projects, financing capital and budgetary support for developing countries. This research will build upon the framework of Suma (2007) but covering the ECOWAS countries from 1970-2017 via spatial regression panel regression methods. The general objective of this research is to examine the impact of external debt on economic growth in ECOWAS countries. To achieve this general objective, the specific objectives of this research are

• Investigating the link between external debt and economic growth of ECOWAS countries;
• Examining the structure, type and composition of ECOWAS’ external debt;
• Identifying the transmission mechanism of external debt influences on economic growth of the ECOWAS countries.

INTRODUCTION

Do countries with high external debt accumulation grow faster or slower? Such a question is not quite easy to answer. In fact, Adepoju et al. (2007) noted that developing countries in Africa are characterized by inadequate internal capital formation as attributed to the vicious circle of low productivity, low income, and low savings. Therefore, the latter
forces less developed countries (LDC) including the countries in Economic Community of West African States (ECOWAS) to look for the necessary support from Western countries to provide the necessary resources to end vicious cycle as described earlier. Such external borrowing has the motif to promote economic growth, not just financing its debt. If debt is utilized well, then not only the economy comes out of crises but it also grows. The lack of basic infrastructure and capital in LDCs requires them to acquire these resources to improve economic growth, and these resources can be purchased on credit taken from the developed nations. However, there are contrarian views about external debt because external debt acts as a major restraint to capital formation and stymies economic growth LDC by crowding out private investment because as debt accumulates, the servicing requirements and the principal repayment increases. Consequently, this external debt becomes a self-actualizing mechanism of increasing poverty that hinders economic growth (Ayadi et al., 2008).

Debt level has increased in most African countries in recent years; furthermore, in some countries at a worrisome pace. But the continent is not yet experiencing a systemic risk of debt crisis. On a regional level, several countries in ECOWAS experienced major episodes of financial crisis that were characterized by unsustainable fiscal deficits after several decades after independence. During this period, however, current account deficits were considered normal. Therefore, ECOWAS countries were encouraged to borrow from abroad to finance their deficits and to create a conducive environment that attracts foreign investment to boost economic growth. Meanwhile, little attention was paid to the individual countries’ absorptive capacities and ability to repay the borrowed funds. The objective of this research is what are the impacts of external debt service on growth and investment in ECOWAS countries? More specifically, this paper examines the

1. high external debt-service has a negative effect on growth in ECOWAS countries
2. high external debt-service crowds out public investment in ECOWAS countries.

EXISTING LITERATURE

Theoretical Literature

Issuing public debt is considered an important mechanism to finance public spending and to stimulate aggregate demand. A theme of the standard Keynesian models consider public debt as necessary to ensure that aggregate demand is high and to keep the economy towards full employment (Sardoni, 2013). According to Modigliani (1961), Diamond (1965), Saint-Paul (1992) and Aizenman et al. (2007), there are two reasons for the negative relationship between external debt and economic growth: (i) existence of crowding-out effects on private investment because of higher real interest rate across the financial market; (ii) public debt is considered an intergenerational burden because it implies a smaller stock of capital for future generations.

There are theoretical discussions considering the external and domestic debt separately. In the case of developing countries, with non-developed capital markets and high currency volatility, this separation is important because the effect of both kinds of debt on the economy is different. For instance, Emmanuel (2012) states that a high level of external debt will reduce the availability of funds for private investment because the government has to pay is external debt. Mehl and Reynaud (2010) consider domestic debt has short-maturity and
exposes a government to a high probability of default. On the other hand, Reinhart and Rogoff (2010) show that the accumulation of a large domestic debt is often at the roots of external debt crises and large inflationary episodes.

Recent studies have argued that in a context of increasing fiscal imbalances, moderate levels of government debt can induce economic growth (Afonso and Jalles, 2016). Mbate (2013) using the Laffer curve theory, concludes that there exists a non-linear relationship between public debt and economic growth. More specifically, an initial level of domestic debt accelerates economic growth through resources for financing budget deficits. However, with a continuous increase in the debt stock, the economy experiences a debt overhang and lower economic growth.

**Empirical Literature**

Several researchers have shown that there exists a negative relationship between external debt and economic growth (Calderón et al., 2013, Swamy, 2015). Now Afonso and Alves (2015) examine the effects of government debt on real per capita GDP growth for 14 European countries from 1970 to 2012. Their study shows that (i) government debt has a negative effect on economic growth, in the short and long-term, (ii) debt service has a much more negative effect on economic performance than debt and (iii) there is an inverted U-shape relationship between the debt ratio and economic growth.

Schclarek (2004) investigates the relationship between public debt and per capita GDP growth in 24 advanced countries and 59 developing countries using panel data for 1970-2002. In advanced countries, the empirical results do not find any robust evidence suggesting that higher public debt levels are not associated with lower GDP growth rates. On the other hand, for developing countries, the empirical results show a negative and significant relationship between public debt and economic growth.

Pattillo et al. (2002) use a large panel dataset of 93 countries over 1969-1998 that focused on developing countries and narrowly on external public debt. They found a non-linear impact of government debt on economic growth. They also found a negative impact of external debt on per-capita GDP growth for net present value of debt levels above 35-40% of GDP. Clements et al. (2003) explore the relationship between government debt and growth for a panel data of 55 low-income countries from 1970 through 1999. Their empirical results show a negative effect of external public debt on growth after value of this debt reaches about 20-25% of GDP.

Reinhart and Rogoff (2010) investigate the relationship between government debt and economic growth using 20 advanced countries and emerging countries from 1970 to 2009. Their empirical results show that advanced countries showed no clear relationship between debt and economic growth until the debt reaches a threshold of 90%. As for developing countries, it was found that an external debt level over 60% and further external debt levels exceeding 90% reduce economic growth quite substantially. More important, inflation becomes significantly higher only for countries with external debt over 90%. Therefore, they conclude that the relevance of debt threshold analysis on economic growth and that public debt may not be so bad.

**THE THEORETICAL FRAMEWORK**
This section delves into the theoretical framework of budget deficits, especially in the context of how it resulted to external indebtedness in ECOWAS countries in recent years. As Buiter (1983) pointed, there are several ways to measure the size of budget deficits. The simplest and most useful, perhaps, is the public sector borrowing requirement or the excess of expenditure over revenue for all levels of government. Other measures of budget deficits include the correction for the inflation component of interest payments commonly referred to as ‘operational deficit’, and the other that exclude all interest payment, also known as the ‘primary deficit’. The nature of budget deficits determines the amount of resources the government may need to fill the existing gap in the budget. An important issue to consider is the benefits and costs of a balanced budget, which raises the question: why is it desirable to achieve a budget in which government expenditure equal tax revenue?

The initial effect of a budget deficit is to lower national saving, which consist of both private and public saving. The specific way in which deficits lower saving can be best understood by examining the national income and product accounts. Private saving is the difference between disposable income and consumption, which can be linearly represented as:

\[ S = Y + Tr + Int - Tx - C, \]

where \( S \) is private saving, \( Y \) is gross national product, \( Tr \) and \( Int \) are government transfer and interest payments respectively, and \( Tx \) is tax revenue and \( C \) is consumption. Substituting for \( Y \) based upon the income expenditure identity,

\[ S = I + (G + Tr + Int - Tx) + Nx, \]

where \( G \) is government spending, \( I \) is investment, and \( Nx \) is net exports. This fundamental relationship points out that a deficit \((G + Tr + Int > Tx)\), with private saving held constant, lowers national saving \((S - G - Tr - Int + Tx)\) and thereby adversely affects investment or net exports or both. The mechanism through which a decline in national saving reduces investment and or net exports is the interest rate. When the government finances a deficit by borrowing from the financial markets, the interest rate rises, thereby reducing investment spending and causing an appreciation in the domestic currency. The appreciation retards exports and stimulates imports.

The preceding analysis depends on the assumption that private saving does not respond to government deficits. Barro (1974), however, argues that private saving will not remain unchanged but instead will increase in response to the sale of government bonds to finance the deficits. This argument is based upon the so-called Ricardian Equivalence theorem, which holds that the private sector fully anticipates higher future taxes to repay the borrowing undertaken to finance the deficit. In order to pay for the expected future increase in taxes the private sector will therefore increase saving accordingly. Bond-financed deficits in this case will have no adverse effect on investment or net exports because the budget deficit will be matched unit to unit by additional private saving, leaving the interest rate unchanged.

The view that deficits will have no effect on economic activity is disputed by both Keynesians and fiscal conservatives, who argue that it is based upon questionable assumptions (Bernheim, 1987). Regardless of the merit of the assumptions, substantial empirical evidence such as Evans (1987, 1988, 1993), fail to support the Ricardian Equivalence theorem. Ball and Mankiw (1995) explained that investment, net exports, and private saving all declined over the period 1982 to 1994, despite the existence of large and persistent deficits in the US. Since deficits appear to adversely affect both investment and net exports, it is important to trace out more fully their possible long-run consequences. In particular, the crowding out of investment translates into a smaller capital stock than
otherwise. This implies a reduction in an economy’s productive capacity and hence long run growth (Barth, Russek and Wang, 1986).

A decline in net exports on the other hand, means that more claims on domestic assets will flow overseas than otherwise to finance those imports that are no longer financed by export earnings. As foreigners receive a greater share of the earnings on domestic assets, national income declines. Since large and persistent budget deficits must eventually be offset by budget surpluses to prevent unbounded growth in debt, future taxes must increase, and spending must decrease to respond to such deficits. Tax increases clearly reduce disposable income as well as create economic inefficiencies through additional compliance and avoidance costs. Spending cuts also impose burdens on the public if transfer payments are reduced or government services are curtailed.

DATA SOURCES AND METHODOLOGY

Data Sources

This empirical analysis uses spatial panel regression model for the ECOWAS countries over the period 1970-2017, annually. The data are from the World Development Indicators (WDI) from the World Bank. Table 1 summarizes the variables used in this analysis and the description of each of these variables and its expected sign in the analysis.

The income per capita is expected to have a negative coefficient because of the convergence effect. The terms of trade growth reflect external shocks to the ECOWAS country and is expected to have a positive coefficient. Then, for the coefficient of gross domestic investment, this is expected to be positive, because it reflects the positive impact of physical capital on growth. Finally, for the foreign aid (not loans), this reflects the inflow of external assistance, and it should be a positive coefficient.

Methodology: Spatial Analysis

Spatial models incorporate both space and time data sets. Spatial linear regression models for cross-sectional data account for specifications where observations are available for a cross-section of spatial units at a point in time. On the other hand, space-time regression models are considering patterns of cross-sectional dependence and heterogeneity among regional entities (Kelejian and Piras, 2017; Anselin, 1998). Equation (1) shows the space-time dependencies and forms of heterogeneity:

\[ y_{it} = X_{it} \beta_{it} + \epsilon_{it} \]  

where \( X_{it} \) is a row vector of observations for spatial unit \( i \) at time \( t \), \( \beta_{it} \) is vector of space-time specific parameters, and \( \epsilon_{it} \) is a vector of error terms. The error term in a spatial regression is characterized by the following conditions:

\[ E[\epsilon_{it}] = 0 \]  

\[ E[\epsilon_{it}\epsilon_{js}] \neq 0 \]  

while equation (2) is a standard condition of the error term in OLS, equation (3) shows the conditions of the error term for the space-time dependencies and the spatial heterogeneity. As pointed out by Kelejian and Piras (2017) and Anselin, (1998), this variation can be across space indexed by \( i \), over time indexed by \( t \), or over space and time indexed by \( i, t \) or \( E[\epsilon_{it}\epsilon_{it}] = \sigma \), which shows the constant variance; \( E[\epsilon_{it}\epsilon_{it}] = \sigma_i \), spatial
heterogeneity; $E[e_{it}e_{it}] = \sigma_t$ time-wise heterogeneity; $[e_{it}e_{it}] = \sigma_{it}$ space-time specific variance. In these conditions, with $i \neq j$ and $t = s$ the dependence is a contemporaneous spatial correlation, which can either be specific to each time $t$, or can be the same for all the periods. This can be shown that $E[e_{it}e_{jt}] = \sigma_{ij}$ which shows the contemporaneous correlation.

Spatial Panel Regression

Spatial panel data models capture spatial interactions across spatial units and over time (Elhorst, Piras, and Arbia, 2010; Lee and Yu, 2010a, Lee and Yu 2010c; Lee and Yu, 2010d, Lee and Yu, 2010b). Equation (1) shows the general static panel model that includes a spatial lag of the dependent variable and spatial autoregressive disturbances:

$$ y = \lambda (I_T \otimes W_N) y + X\beta + \varepsilon \quad (1) $$

where $y$ is an $N_T \times 1$ vector of observations on the dependent variable, $X$ is a $N_T \times k$ matrix of observations on the non-stochastic exogenous regressors, $I_T$ an identity matrix of dimension $T$, $W_N$ is the $N \times N$ spatial weights matrix of known constants whose diagonal elements are set to zero, $\varepsilon$ is the disturbance term and $\lambda$ the corresponding spatial parameter. Equation (2) shows the disturbance vector as the sum of two terms which is given as

$$ \varepsilon = (\xi_T \otimes I_N)\mu + u \quad (2) $$

where $\xi_T$ is a $T \times 1$ vector of ones, $I_N$ an $N \times N$ identity matrix, $\mu$ is a vector of time invariant individual specific effects that are not spatially autocorrelated, and $u$ is a vector of spatially autocorrelated innovations that follow a spatial autoregressive process which is given as

$$ u = \rho (I_T \otimes W_N)\varepsilon + \nu \quad (3) $$

with $\rho (|\rho| < 1)$ as the spatial autoregressive parameter, $W_N$ the spatial weights matrix, $\nu_t \sim$ IID $(0, \sigma_\nu^2)$ and $\varepsilon_t \sim$ IID$(0, \sigma_\varepsilon^2)$.

The individual effects can be treated as fixed or random as in the traditional panel regression models. In a random effects model, it is implicitly assuming that the unobserved individual effects are uncorrelated with the other explanatory variables in the model. So in this case, $\mu_i \sim$ IID $(0, \sigma_\mu^2)$ and the error term can be given as $u = (I_T \otimes B_N^{-1})\nu$ and where $B_N = (I_N - \rho W_N)$. Then, from the latter the error term for the spatial panel regression becomes $\varepsilon = (\xi_T \otimes I_N)\mu + (I_T \otimes B_N^{-1})\nu$ and the variance-covariance matrix for equation (4) becomes

$$ \Omega_\varepsilon = \sigma_\varepsilon^2[I_T \otimes (B_N^2B_N^{-1})] \quad (4) $$

From this specification of the spatial panel regression, the maximum likelihood estimation will be used, and we also determine the fixed and random effects used. These results will be presented in the discussion of the empirical results. For the analytical details for these inferential tests, the reader is referred to the references cited earlier in this section.
EMPIRICAL RESULTS OF THE SPATIAL PANEL REGRESSION

We present the results of the estimated spatial panel regression models for the ECOWAS countries across space and time from 1970-2017. Table 2 summaries these results.

The estimated regression yields significant spatial lag coefficients with the expected sign. The R-square listed is called a so-called pseudo R-square, which are not directly comparable with the measure and interpretation as in the OLS estimation. From the output, the measures of fit are the Log-Likelihood (LIK), Akaike Information Criterion (AIC), and Schwarz Criterion (SC) are given. The smaller the values of these measures, the better the regression fit. As indicated in the Log Likelihood and Akaike Criterion, the models display similar fits across time with some periods exhibiting better regression fits than the others. The spatially adjusted Breusch-Pagan Tests is not significant, and this indicates the absence of heteroskedasticity problems across time.

From the results of the growth equation, the initial per capita income variable, which is included to capture the speed of convergence among countries in ECOWAS. The coefficient of this variable should be negative under the conditional convergence framework, since due to diminishing returns to inputs, the higher the initial values of per capita income the lower the growth rate. However, the variable does not display the expected negative sign and is statistically significant.

The external debt ratios (debt-service to exports of goods and services and total debt stock to GDP), which are the key variables that capture the impact of external debt on economic growth in ECOWAS countries It showed a negative sign meaning that external debt-service is negatively correlated with economic growth in ECOWAS countries. This finding directly imply that the debt overhang hypothesis is only empirically supported. Empirical support for the debt overhang hypothesis is achieved if the coefficient of the debt-service ratio has a negative sign with statistical significance.

The terms of trade variable are intended to capture the external shocks to these economies since ECOWAS countries depend mainly on the export of primary products and is expected to have either positive or negative coefficients depending on the international market forces. A positive coefficient will indicate that favorable terms of trade contributes positively to growth, while a negative coefficient would affect growth otherwise. The estimated results show a positive coefficient for the terms of trade which indicates that trade contributes positively to the economic growth of ECOWAS. If the sign was negative, this would mean that ECOWAS economies are highly vulnerable to external shocks since they rely mainly on the export of primary agricultural products as their foreign exchange earner. But keep in mind that the external shocks that are reflected in the terms of trade depend on the international market forces. When these forces are in their favor, the prices of their export commodities rise relative to other commodities in the world market and vice versa.

The coefficient of the gross domestic investment variable should be positive since a higher domestic investment is expected to contribute positively to economic growth in ECOWAS. From the empirical results, the sign is positive which means that the gross private domestic investments contribute positively to the economic growth in the ECOWAS countries. If the coefficient was negative, it is likely that not all investments in ECOWAS yielded a rate of return higher than the cost of investment due to poor investment decisions, mismanagement of investment funds, and internal political and macroeconomic stabilities.

For the foreign aid variable is included in the model to capture the effects of foreign resource inflow in the form of grants, not loans, into the ECOWAS countries. The coefficient
should be positive since the higher the inflow of resources, the more it contributes positively to economic growth in the region, having significant effects on economic growth in ECOWAS countries.

A limited number of regression diagnostics are provided in the maximum likelihood estimations. The Breusch-Pagan Tests for heteroskedasticity in the error terms are insignificant, suggesting that heteroskedasticity is not a problem in this specification.

Finally, ss for the autoregressive term (ρ), a positive coefficient would indicate the presence of a positive spatial dependence on economic growth among ECOWAS countries whereas a negative coefficient would show a negative spatial relationship. In this model, it showed a negative coefficient. Consequently, the economic growth in one country of ECOWAS may impact negatively on growth in neighboring countries because of the strong competition among them for resources as well as the in the export of goods and services. If one country becomes more competitive in obtaining natural and financial resources than the others, it grows faster while the neighbors would experience slower economic growth.

SUMMARY AND CONCLUSION

This paper analyzed empirically the external debt problem in the ECOWAS countries via a spatial panel regression that incorporate the influence of spatial interaction and spill-over effects to investigate the impact of external debt on economic growth in the ECOWAS countries from 1970 through 2017. This spatial panel regression used the annual GDP growth rate as the dependent variable, while the regressors consisted of per capita income, terms of trade, gross private domestic investment, external debt, and foreign aid inflows, not loans.

Since independence of many of these ECOWAS countries, they have heavily on foreign capital, mostly in the form of foreign loans to supplement their low domestic savings and to boost economic growth and investment. The scarcity of domestic financial resources for development is a problem in many developing countries, not just ECOWAS. This problem is known as the, “the financing gap problem.” Under the latter, it predicts that by injecting foreign capital even in the form of external loans into the domestic economy would generate economic growth. However, this prediction is not supported by the current external debt problem in the region.

Prior studies have used the traditional econometric methods that avoided the any spatial component. This analysis used a spatial panel regression model to determine the effects of spatial interaction and spatial dependence among ECOWAS countries from 1970 through 2017 which would include some years of crisis in the ECOWAS countries. There is a spatial element because each of these ECOWAS countries would interact with each other because the economic growth in one country may impact the growth trajectory of other ECOWAS countries. This paper laid out the foundation of the economic growth model, but future work would consider the addition of an investment model.

REFERENCES


Sardoni, C. (2013) How to deal with the public debt: Ideas from Keynes, Lerner, Domar, and Hicks. The Sapienza University of Rome.


**Table 1. Description of the Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per Capita Income</td>
<td>The average income measures the average income earned per person in a given nation in a specified year. It is calculated by dividing the area's total income by its total population.</td>
</tr>
<tr>
<td>Debt Service to Imports</td>
<td>This is the sum of principal repayments and interest actually paid in currency, goods, or services on the long-term debt, interest paid on short-term debt, and repayments (repurchases and charges) to the International Monetary Fund.</td>
</tr>
<tr>
<td>Total Debt Stocks</td>
<td>Debt owed to nonresidents repayable in currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less.</td>
</tr>
<tr>
<td>Terms of Trade</td>
<td>The ratio between the index of export prices and the index of import prices.</td>
</tr>
<tr>
<td>Gross Private Domestic Investment</td>
<td>The measure of physical investment used in computing GDP in the measurement in a nations' economic activity.</td>
</tr>
<tr>
<td>Foreign Aid (not loans)</td>
<td>Measures the inflow of economic assistance as grants, not loans to the nation.</td>
</tr>
</tbody>
</table>
Table 2. Empirical Results of the Spatial Panel Regression

<table>
<thead>
<tr>
<th>Growth Model</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. Squared</td>
<td>0.793</td>
</tr>
<tr>
<td>LIK</td>
<td>-29.728</td>
</tr>
<tr>
<td>AIC</td>
<td>73.456</td>
</tr>
<tr>
<td>SC</td>
<td>76.850</td>
</tr>
<tr>
<td>Moran’s I</td>
<td>-0.237</td>
</tr>
<tr>
<td>Lag Coefficient ρ</td>
<td>-1.066</td>
</tr>
<tr>
<td>Constant</td>
<td>-23.602</td>
</tr>
<tr>
<td>Log Per Capita Income</td>
<td>4.195</td>
</tr>
<tr>
<td>Log Debt Service to Exports</td>
<td>-3.259</td>
</tr>
<tr>
<td>Log Total Debt Stocks</td>
<td>1.580</td>
</tr>
<tr>
<td>Log Terms of Trade</td>
<td>0.727</td>
</tr>
<tr>
<td>Log Gross Private Domestic Investment:</td>
<td>2.211</td>
</tr>
<tr>
<td>Log Foreign Aid (FAID)</td>
<td>2.662</td>
</tr>
<tr>
<td>Variance, σ² (error)</td>
<td>0.7915998</td>
</tr>
</tbody>
</table>

Diagnostics for Heteroskedasticity (Random coefficients)

| Breusch-Pagan Test | 2.887 |

Diagnostics for Spatial Dependence (Spatial Lag Dependence for Weight Matrix)

| Likelihood Ratio Test | 9.406 |

Mean of fixed-effects = -0.0137

Notes: Dependent Variable is the annual growth rate (%); p-values are in parentheses. LIK is the value of the log likelihood function. AIC is the value of the Akaike information criterion and SC is the Schwarz information criterion.
IMPACT OF GREEN GROWTH ON THE SUSTAINABLE DEVELOPMENT OF INDIA

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ABSTRACT

Green growth has emerged in international policy discourse over the recent years. A green economy results in improved human well-being and social equity while significantly reducing environment risk and ecological scarcities. The World Bank (2018) reports that India has a remarkable economic growth record. This has been clouded by a degrading environment and growing scarcity of natural resources. The green growth should not only ensure economic use of environmental resources but should also ensure inclusive sustainable growth. This paper will discuss green energy, how it can be utilized and how renewable energy will play a major role in its inception.

INTRODUCTION

Green growth has emerged in international policy discourse over the recent years. Green growth and green economy are both the prior concepts of sustainable development. A green economy is results in improved human well-being and social equity while significantly reducing environment risk and ecological scarcities. In another way, green economy can be considered a component of the ecosystem in which it resides. The standard version of green growth, which in the long run can create economic benefits of environmental protection and a strong interpretation, claims more boldly that environment policy can be a driver for growth. It is economic growth which also achieves environment protection. Environment conditions are important not only for sustainability, but also because of their immediate impact on the quality of people’s lives. The World Bank (2018) reports that India has a remarkable economic growth record. This has been clouded by a degrading environment and growing scarcity of natural resources. For example, India’s air pollution has not improved much since the 1990s and continues to be a major issue, causing millions of deaths (World Health Organization, 2016). The green growth should not only ensure economic use of environmental resources but should also ensure inclusive sustainable growth. This paper will discuss green energy, how it can be utilized and how renewable energy will play a major role in its inception.

Green Growth in the Indian Context

Green growth involves rethinking growth strategies with regard to their impact(s) on environmental sustainability and the environmental resources available to poor and vulnerable groups. There are several aspects that India needs to consider in order to have sustainable green growth strategies. The first should be to adopt a climate friendly and a cleaner path than the one followed hitherto by others at corresponding level of economic development. They should also reduce the emissions intensity of its GDP by 33–35 per cent.
by 2030 from their 2005 level. They should look to achieve about 40 per cent cumulative electric power installed capacity from non-fossil fuel–based energy resources by 2030 with the help of transfer of technology and low-cost international finance including from Green Climate Fund (GCF). India will also need to create an additional carbon sink of 2.5–3 billion tons of CO2 equivalent through additional forest and tree cover by 2030.

India needs to better adapt to climate change by enhancing investments in development programs in sectors vulnerable to climate change, particularly agriculture, water resources, Himalayan region, coastal regions, health, and disaster management. They should try to mobilize domestic and new and additional funds from developed countries to implement the above mitigation and adaptation actions in view of the resource required and the resource gap. The government will need to build capacities, create domestic framework and international architecture for quick diffusion of cutting edge climate technology in India and for joint collaborative research and development for such future technologies.

**India’s Green Growth Challenges**

There are several challenges that will be big hurdles to overcome. The biggest hurdle will certainly be the air. The concentration of the pollutants monitored show that reparable suspended particulate matter concentrations violate the National Ambient Air Quality Standards for most cities. According to Central Pollution Control Board, Class I cities and Class II towns in the country generate around 38,254 million liters per day (MLD) of sewage of which only 11,787 MLD (31%) is treated and balance is discharged untreated.

Along with the air quality, there is decline in quality of forest despite the increase in overall increase in forest and tree cover. India is moving towards perennial water shortage. The National Institute of Hydrology estimates water availability for India to be 938 cubic meter per capita per year. A country with less than 1,700 cubic meter per capita per year is considered as water stressed.

Just as with the majority of the world, climate change is a reality that all have to face. Past observations indicate that the annual mean temperature of India has showed significant warming trend of 0.51°C per 100 year (Ministry of Environment & Forests, Government of India, 2010). The ecological impacts of global warming could be very high.

The energy supply in India is heavily dependent on fossil fuels with coal and petroleum products together accounting for about 88% of the total primary energy supply. Most of the oil consumed in the country is imported, posing serious challenges for long-term energy security.

Indian cities face severe challenges related to quality and availability of infrastructure, such as power, telecom, roads, water supply, and mass transportation, which could pose serious constraints to economic growth if left unaddressed.

Per-capita energy consumption is very low in India compared to developed and many developing countries. However, the energy and electricity demand is expected to grow through to 2040, as portrayed in Figure 1.

**Present Power Scenario in the Country**

The power supply in India is well distributed across the state, central and private sectors, as shown in Table 1. Most of India’s power capacity is from fossil fuel sources such as coal, natural gas and oil. The contribution of renewable energy sources, other than hydro are about 23% and the contribution of hydro power is about 13%, as shown in Table 2.

**Case for Renewable Energy Solutions in India**
Supply-demand gap is increasing rapidly over time in India, as shown in Figure 2. Renewable energy is the only technology that offers India the theoretical potential to service all its long-term power requirements. According to reports, Solar Radiant Energy over India, by the India Meteorological Department, Government of India, goes as follows, “The solar energy received by Earth is more than 15,000 times the world’s commercial energy consumption and over 100 times the world’s known coal, gas and oil reserves. And this energy is readily available during the day for anyone to tap and that too free.”

Domestic coal supply is limited and in poor quality. Foreign supply of hydrocarbons has a serious impact on country’s energy security. Renewable Energy (RE) sources are not depleted. RE is non-polluting. Reinvestment can be used for many decades without affecting the environment.

**Present India’s Renewable Energy Capacity**
- Wind 20,294 MW
- Solar Power 2,208 MW
- Small Hydropower 3,774 MW
- Biomass Power & Gasification 1,286 MW
- Bagasse Cogeneration 2,513 MW
- Waste to Power 99 MW

**Renewable Energy Development Potential for India**
- India has Abundant Solar Energy Resources:
  - > 100,000 MW by 2020
  - > 200,000 MW by 2025
  - Harness Wind Energy near the sea shore and other windy sites
  - > 50,000 MW by 2020
  - > 100,000 MW by 2025
  - Additional potential for to tap Small Hydro Power plants, Biomass, Biogas, Geothermal, etc.

These abundance resources are so assuming favorable policy, incentives, tariffs, and financing is provided.

**Challenges for Renewable Energy Development in India**
- Though there are many benefits to using RE in India, there are just as many challenges. Some of these challenges include: optimal pricing of power generated from the renewable energy sources, maintaining the quality and consistency of renewable energy sources, the cost of technology development and production, availability of financing for production, slow pace of rural electrification and the pace of reforms in the rural electricity sector.

India’s energy strategy is important for any global discussion about lowering carbon emissions. Most current plans focus on cheaper renewable energy sources. However, scaling renewable energy even further, that is to say, towards deep decarburization of India’s energy system, is a much harder task, and will require a host of technical, policy, and regulatory improvements (Tongia, 2018).

**Development Opportunities for Renewable Energy**
- There are many development opportunities for renewable energy. Some of these opportunities are: grid interactive renewable energy generation systems, renewable energy for urban, industrial and commercial applications as well as rural applications, irrigation,
enterprises, cooking, lighting etc. There would also be research, design and development in new renewable energy generation and applications.

With all of these developmental opportunities in mind, the best renewable energy option is solar. Solar energy will be able to meet most future energy needs for India. Solar energy receives an equivalent to nearly 5,000 trillion kWh/year. There is solar radiation of 4 to 7 watts/square meter in India. Most parts of India have 300-330 sunny days in a year. Power generation potential using solar PV technology is around 20MW/sqkm and using solar thermal generation around 35MW/sqkm. India could build 1,000 GW of solar on just 0.5% of its land. India’s Present Total Generation Capacity is about 210 GW.

There are many benefits in utilizing solar energy. Solar energy is a decentralized nature of generation. It can be located close to demand and has a reliable and predictable performance for over 25 years. Solar energy also requires low operational maintenance. It is also a domestic and freely available fuel source with zero human displacement. Most States Tariffs are already established for this type of energy. Also, the average time to build locations to produce solar energy is about 1 Year versus 13 Years for Nuclear. And potentially one of the biggest positives in using solar energy is that it does not have a negative environmental impact. Cost of solar power generation has decreased over order of magnitude, which is also a major positive of this energy source, as shown in Figure 3.

**Measures Undertaken by Government to Promote Renewable Energy Development**

Several measures have been undertaken by the Indian government to promote renewable energy development. One of them is the Jawaharlal Nehru national solar mission (JNNSM). Another is the REC or Renewable Energy Certificate. The Indian Government has also created a renewable purchase obligation as well as implemented state policies and has provided the encouragement of Foreign Direct Investment. An equity investment was allowed with permission from Foreign Investment promotion board proposal to make it under the automatic route. Foreign investors can enter into a financial/technical joint venture with an Indian partner. Foreign investors can also set up renewable energy-based power generation projects on Build, Own and Operate (BOO) basis.

India has set an ambitious 2022 solar which indicates that they will be working to install more solar capacity, and their targeted numbers are shown in Figure 4. According to the International Renewable Energy Agency, India overtook the continents of North America and Europe, as well as Japan, in terms of solar power capacity added during 2017. This is shown in Figure 5, which illustrates the installed solar power capacity that has been added in 2017 (CleanTechnica, 2018).

**Future Growth Drivers for Renewable Energy in India**

There are other future growth drivers for renewable energy in India, besides the support from the Indian Government. One is that, in regard to the demand and supply gap, supply will regularly be over stripped by demand. There is also a large renewable energy potential in the abundance of sites for tapping natural and renewable sources of energy. The availability of new forms of capital, like private equity, CDM, and an increase of the presence of PE funds in clean energy is another aspect of the positive growth of renewable energy. India is also emerging as a dominant player in CDM projects. The government is also increasing state level initiatives; states such as Punjab, Haryana, AP are taking the lead in development of a renewable energy project.

**Proposed Action Plan to Boost Renewable Energy**

This is a proposed action plan to boost renewable energy. First, India should invest more in Renewable Energy and Energy Efficiency. They also need to enact a National Renewable
Energy Standard of 20% by 2020 to create demand, new industries and innovation, and a new wave of millions of green jobs. Also, the government needs to boost the development and implement nation-wide user-friendly comprehensive Renewable Energy policies. Other aspects that needs to be considered are: depreciation, tax credits, financing funds, international partnerships/collaboration, incentives for new technology, zero import and excise duty on materials, and low interest rate loans.

As according to Mohd Sahil Ali (2018), Indian “policies must focus on stimulating ‘good’ and curbing ‘bad’ demands. The addition of new and more complex loads, especially in cities, indicates that the key bottlenecks to meeting demand will lie in the realm of distribution infrastructure and regulatory frameworks to manage increasing volatility in daily and seasonal loads, rather than expansion of total electricity supply.”

There is also an urgent need to develop a nation-wide Comprehensive user-friendly Roof-Top Solar Policy to promote small-scale and decentralized solar power generation and to solve the energy crises by bridging demand-supply gap. The government also needs to aggressively expand large utility-scale solar generation, using Photovoltaic (PV), Concentrated Solar Power (CSP) and Concentrator Photovoltaic (CPV) technologies. Lastly, they need to develop, promote and establish utility scale solar farms co-operatives, wind farms co-operatives, offshore wind farms and co-operatives.

CONCLUSIONS

India is seriously investing in green growth. Energy crisis is one of the major hurdles for green growth. Renewable energy, especially solar energy, could be an answer for India’s increasingly high energy demand. There are many benefits and positives in using renewable energy as a source of power, many of which will not only improve the energy state of India but also, the environment. The Indian government and the private sectors should take strong measures to promote renewable energy. They should also consider the major points of the action plan, which include: investing in renewable energy and efficiency, enacting a standard to create demand, new industries and innovation, and millions of green jobs, etc. There are so many benefits that should not be ignored.
Table 1: Power Supply Distribution

<table>
<thead>
<tr>
<th>Sector</th>
<th>MW</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Sector</td>
<td>84,637</td>
<td>24.2%</td>
</tr>
<tr>
<td>Central Sector</td>
<td>104,039</td>
<td>29.7%</td>
</tr>
<tr>
<td>Private Sector</td>
<td>161,487</td>
<td>46.1%</td>
</tr>
<tr>
<td>Total</td>
<td>3,50,162</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Power Capacity

<table>
<thead>
<tr>
<th>Fuel</th>
<th>MW</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Thermal</td>
<td>2,22,927</td>
<td>63.7%</td>
</tr>
<tr>
<td>Coal</td>
<td>1,91,093</td>
<td>54.6%</td>
</tr>
<tr>
<td>Gas</td>
<td>24,937</td>
<td>7.1%</td>
</tr>
<tr>
<td>Oil</td>
<td>638</td>
<td>0.2%</td>
</tr>
<tr>
<td>Hydro (Renewable)</td>
<td>45,399</td>
<td>13%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>6,780</td>
<td>1.9%</td>
</tr>
<tr>
<td>RES** (MNRE)</td>
<td>74,082</td>
<td>21.2%</td>
</tr>
<tr>
<td>Total</td>
<td>350,162</td>
<td></td>
</tr>
</tbody>
</table>

Source: Ministry of Power; Government of India, https://powermin.nic.in/en/content/power-sector-glance-all-india
Figure 1: Low Per-capita Energy Consumption

India's electricity demand, population, GDP per capita and per capita power consumption growth

Source: https://www.bloomberg.com/professional/blog/india-triple-energy-challenge/

Figure 2: India Energy Supply-Demand Gap

**Figure 3: Cost of Solar Power**


**Figure 4: India Sets Ambitious 2022 Solar Goal**

Source: [http://www.wri.org/blog/2016/05/india-charts-roadmap-achieve-ambitious-solar-targets.](http://www.wri.org/blog/2016/05/india-charts-roadmap-achieve-ambitious-solar-targets.)
Figure 5: New Solar Power Capacity added in 2017

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WHAT MOTIVATES STUDENTS TO TAKE THE CPA EXAM?

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ABSTRACT

This study examines factors that are associated with an accounting student’s intention to take the CPA examination. The sample is comprised of 394 accounting students from 13 colleges and universities in Pennsylvania. Intrinsic motivation, social approval, and sensitivity to continued education were found to be significantly associated with an accounting student’s intention to pursue the CPA examination. An accounting student’s extrinsic motivation, desire to engage in non-technical activities, and self-efficacy were not associated with intention to pursue the CPA exam. The findings will be of interest to numerous stakeholders including accounting educators, professional accounting associations, and organizations which employ professional accountants.

INTRODUCTION

A preliminary study was conducted by Trout and Blazer (2018) which was prompted by findings published in the 2015 American Institute of Certified Public Accountants’ (ACIPA) “Trends in the Supply of Accounting Graduates and the Demand for Public Accounting Recruits” (AICPA, 2015). The report showed that despite increased enrollments in accounting programs and hiring by CPA firms, the number of CPA examination candidates had declined. This trend has important implications on the public and profession considering that 40% of today’s CPAs are expected to retire by 2020 (AICPA, 2016).

The primary concentration of the authors’ study was related to numerous demographic variables and their association with a student’s intention to pursue the CPA examination. No significant differences were found based on a student’s GPA or gender. Parental education levels appeared to be associated with a student’s intentions to pursue the CPA credential, as well as a student’s plan to work in either public or non-public accounting. The sample was comprised of 92 students at one university in the Northeast.

The sample for this study is comprised of 394 accounting students drawn from 13 colleges and universities in Pennsylvania. This study goes beyond student characteristics to examine how students’ perceptions, attitudes, and motivations may impact their intentions to take the CPA examination. There are numerous articles examining students’ perceptions related to accounting as a subject and profession but studies which examine students’ intentions in relation to taking professional certification examinations are limited. Existing articles on this topic commonly focus on cost, educational requirements and components of the theory of planned behavior as factors which influence a student’s intentions to pursue a
professional accounting certification. The literature review summarizes these factors and builds on existing research by integrating a new variable related to a student’s desire to engage in non-technical business activities; an increasingly important concern among educators and professionals.

LITERATURE REVIEW

Educational Requirements

While the CPA examination is the same in all jurisdictions, the eligibility requirements for taking the examination are not. Some states allow candidates to sit for the examination after completing their standard 120 credit hour bachelor’s program. Others require 150 semester-hours. To obtain 150 hours of education, students may obtain a master’s degree but it is not required (AICPA, n.d.-b). Semester hours required in specific accounting courses vary by jurisdiction. Currently, the U.S. Virgin Islands is the only U.S. jurisdiction that does not require at least 150 hours of education for licensure (NASBA, n.d.).

The objective of implementing the 150-hour requirement was to improve the overall quality of work performed by CPAs (AICPA, n.d.-a). Research related to the effect of the 150 credit hour requirement on students’ CPA intentions is mixed. Many authors posit that the 150 credit hour requirement is associated with a decrease in CPA candidates (A. Allen & Woodland, 2006; Bierstaker, Howe, & Seol, 2004; Carpenter & Hock, 2008; Carpenter & Stephenson, 2006; Jackson, 2006). Carpenter and Stephenson (2006) found that while the number of candidates increased significantly in the year before the 150-hour rules went into effect, the subsequent impact was a 60 percent reduction in CPA examination candidates, using data from 1985-2002. Allen & Woodland (2006) found a 33 percent average decline in candidates when analyzing data from the National Association of State Boards of Accountancy (NASBA) related to the period of 1991-2002. Underlying factors that contribute to the 150-hour’s effect on intention to take the CPA examination have not been addressed in literature. Examples include factors such as the opportunity cost associated with meeting the requirements, increased out-of-pocket costs, or academic rigor.

Metinko and Gray (2010) found no relationship between the number of CPA exam candidates and the education requirements in each of the US jurisdictions. Schroeder and Franz (2004) studied the immediate and short term effects of 150-hour requirement’s implementation. The researchers found that first time candidates dropped in the year the new requirement took place, but first time candidates recovered uniformly to approximately 50-60 percent of the baseline period in subsequent years. The authors’ conclusion was that the 150-hour rule was not primarily responsible for the decline in first time CPA examination candidates. In terms of students’ perceptions, Schroeder and Franz cited a July 2000 study by the Taylor Research and Consulting Group which found that students do not consider the 150-hour rule to be a barrier. 76 percent of high school students and 80 percent of college students who participated in the survey already had plans to pursue a graduate degree. Nelson, Vendrzyk, Quirin, and Kovar's (2008) 15-year longitudinal study of accounting students supports the claim that more students intend to pursue graduate degrees. However, Charron and Lowe's (2009) survey of accounting alumni found that 40 percent of graduates who had achieved the required credits had not taken a single part of the CPA examination. Half of the “exam ready” graduates had achieved the required credits more than one year earlier.

Theory of Planned Behavior
The next three factors affecting students’ intentions to pursue the CPA examination are grounded in beliefs. Many articles have examined how students’ beliefs impact their pursuit of various career paths (C. L. Allen, 2004; Cohen & Hanno, 1993; Dalton, Buchheit, & McMillan, 2014). Researchers examining accounting students’ beliefs in relation to their intentions to pursue the CPA examination point to the theory of planned behavior (Coe, 2016; Sandra Felton, Dimnik, & Northey, 1995; Wen, Hao, & Bu, 2015). The theory of planned behavior contends that intention is the best predictor of behavior (Ajzen, 1991).

Social influence

Social influence, or “subjective norm”, is one of the three variables underlying the theory of planned behavior. Subjective norm is an individual’s perception of whether people who are important in the individual’s life (referents) favor a behavior (Sandra Felton et al., 1995). It can also be thought of as the perceived social pressure or approval of certain behaviors. For example, a student who believes a teacher or family member would want him or her to take the CPA exam may be more inclined to pursue this endeavor. Wen, Hao, and Bu (2015) found that the influence of referents positively influence Chinese accounting students’ intentions to pursue the CPA examination. Coe's (2016) study of upper level division accounting students found factors such as the perception of social support from friends and family, access to a role model who is a CPA, and support from college faculty to take the CPA examination to be positively associated with the intention to sit for the CPA examination. One party that does not appear to be exerting a high level of influence is employers. While public accountants report significantly higher perceived pressure to pass the CPA from their employers than accountants in non-public jobs, the mean rating reported by a sample of accounting alumni was 4.6 on a 7-point Likert scale (Charron & Lowe, 2009). In 2004, a joint task force of the AICPA, NASBA, and Thomson Prometric Inc. was assembled to research why enrollment declined substantially in the first year of computerized testing. Interestingly, respondents did not report the computerized test as an obstacle. Instead, they reported feeling no pressure from their employers to take the CPA examinations and also cited work and family commitments as hindrances (“Journal of Accountancy: Professional Issues,” 2005).

Self-efficacy

The CPA examination can be a daunting pursuit. The average candidate requires roughly 17-18 months and six total attempts to pass the fourth part of the examination (2014 Candidate Performance book: The University Edition, 2014). Self-efficacy is the confidence in one’s own ability to achieve intended results (Ormrod, n.d.). Studies have found self-efficacy to be positively related to a student’s decision to join the accounting profession (Hayes & Credle, 2008; James & Hill, 2009). Coe (2016) found that self-efficacy was positively associated with the intention to sit for the CPA examination as soon as a candidate is eligible. Wen et al. (2015) found that the perceived incapability to succeed was negatively associated with the intention to pursue the CPA examination. Timing may also affect self-efficacy. CPA exam data consistently show a higher pass rate for candidates who test soon after meeting the educational requirements (NASBA, 2017). As potential candidates delay taking the exam and become further removed from school, they may perceive passing the exam to be more difficult (Arens & Elder, 2006; Buchanan, Vucinic, Rigos, & Gleim, 2004; Weidman, 2006). In general, literature consistently shows that students who believe they will succeed are more likely to engage in a challenging undertaking like the CPA examination.

Intrinsic and extrinsic motivation
Beliefs about the consequence of a behavior and the desirability of the consequence is the third factor in theory of planned behavior. These beliefs center on intrinsic and extrinsic motivators. For example, the belief that taking the CPA examination will contribute to securing a fulfilling (intrinsic) or well paying (extrinsic) job will likely increase the intention to sit for the examination. Students’ positive attitudes toward accounting as a profession are commonly grounded in extrinsic factors such as salary prospects, job security, and opportunities for advancement (Ahmed, 1997; S. et al. Felton, 1994; Francisco, Noland, & Kelly, 2003; Germanou & Hassall, 2009; Mustapha & Abu Hassan, 2012; Nelson et al., 2008; Stivers & Onifade, 2014; Sugahara, Hiramatsu, & Boland, 2008). Many students feel that a career in accounting will have little personal satisfaction (C. L. Allen, 2004; Marriott & Marriott, 2003; Stivers & Onifade, 2014).

While Wen et al. (2015) found students associate extrinsic factors with the CPA credential, these researchers found intrinsic factors to be significant in relation to students’ intentions to pursue the CPA examination. Coe (2016) also found students’ genuine interest in accounting to be positively associated with intention to pursue the CPA exam but did not find a significant positive relationship between perceived better financial compensation and the choice to pursue the CPA credential. Intrinsic motivation comes from within an individual. It is not driven by external rewards. Instead, interest in an activity is stimulated from the personal satisfaction or fulfillment derived from the activity. Jackling and Calero (2006) found that personal satisfaction with studies in accounting was the most significant predictor of intention to become an accountant. work on the topic of personal relevance and question phrasing comes from mathematics.

**Desire to engage in non-technical business activities**

Stereotypes can impact the selection process of individuals choosing a profession (Arguero & Howard, 2009). Holland (1973) found that individuals base career selections on vocational stereotypes because vocation interest can be a way for individuals to express their personalities. Negative stereotypes may lead students to view a career track as incompatible with their self-image. Many studies find that students perceive the subject of accounting to be dull or boring (Larkin, 1991; Lehman, 2001; Picard, Durocher, & Gerdron, 2014; Stivers & Onifade, 2014).

The reality is that an accountant’s role has transitioned from “bean counter” to “business partner” (Institute of Management Accountants, n.d.). Rapid advancements in technology and globalization have contributed to this change (Albrecht & Sack, 2001; Mohamed & Lashine, 2003). Traditionally, public accountants were primarily preparing financial information for decision makers, auditing financial statements, or assisting with tax and other regulatory requirements. Today’s competitive environment has compressed margins on many services previously offered by public accounting firms. Consequently, firms are channeling their resources into advisory and consulting services and outsourcing lower-value services. The emphasis is no longer value stewardship (e.g. auditing, statutory reporting, compliance); it is value creation (e.g. financial planning and analysis) (Siegal, Sorensen, Klammer, & Richtermeyer, 2010; Thomson, 2017). Accordingly, accounting firms are rebranding themselves as “professional service firms” (Albrecht & Sack, 2001).

The shift away from preparers to advisors means today’s accountants, more than ever, need to possess critical thinking skills to anticipate, identify, and solve problems. Mohamed and Lashine (2003) describe this as having the ability to reach conclusions to questions when all of the relevant information is not readily accessible. In addition to the ability to think critically, employers want candidates who are able to communicate their recommendations.
well and do this successfully in a team environment (Blanthorne, Bhamornsiri, & Guinn, 2005; Borzi & Mills, 2001; Hassall, Joyce, Arquiero Montano, & Donkeys, 2005). Rebecca Mahler, a Senior Manager of College and University Initiatives at the AICPA says that “Critical thinking and relationship-building, as well as verbal and written communications skills are crucial to being a successful CPA. Technical knowledge is a minimal requirement” (McCabe, 2015).

Unfortunately, reports from employers frequently indicate new accounting graduates have challenges with communication and teamwork (B. Jackling & DeLange, 2009; Ping, Grace, Krishnan, & Sudha, 2010; Yu, Churyk, & Chang, 2013; Zaid & Abraham, 1994). ManpowerGroup’s annual Talent Shortage Survey consistently marks accounting and finance as one of the hardest jobs to fill (Global Upside, 2014).

Many say universities are not preparing students in the non-technical or professional skills required by the modern accounting profession (Kavanagh & Drennan, 2008; Mohamed & Lashine, 2003). Vein (2016) states that most accountants are trained to be technical experts first, managers second and businesspeople third.”

Research shows that accounting students minimize the role that communication and other generic skills play in achieving a successful career in accounting (Ameen, Jackson, & Malgwi, 2010; Ping et al., 2010). Accounting majors rank math skills as significantly more important than communication skills (Meixner, Lowe, & Nouri, 2009). Those who choose to major in accounting also have higher than average apprehension about oral communication (Meixner et al., 2009). Ping et al’s. (2010) survey found that the primary reason why students select accounting as a major was perceived competencies in quantitative areas. The second highest rate reason was “I do my best work alone” (p. 63).

After entering the workplace, accounting alumni report that they are inadequate in these non-technical areas (B. Jackling & DeLange, 2009). One study surveyed 262 upper level accounting students and 231 accounting professionals who were alumni of the same university (Ping et al., 2010). When comparing students’ and professionals’ responses, alumni rated communication skills much higher than students. Researchers are concerned that incorrect impressions are turning off potential candidates who are well suited for public accounting while possibly attracting candidates who are trying to avoid the very skills needed to be successful in this field (Albrecht & Sack, 2001; Ping et al., 2010).

**Sensitivity to cost**

Application, registration and examination fees vary by jurisdiction. The total cost generally exceeds $1,000, assuming a candidate passes each section on the first try. Re-examination candidates are generally required to pay both the registration and examination fee for subsequent attempts (NASBA, n.d.). The average candidate requires 6 total attempts to pass the fourth section of the examination (2014 Candidate Performance book: The University Edition, 2014). There are also unquantifiable opportunity costs associated with the time invested in preparing for the examination. Candidates that utilize exam preparation courses incur additional out-of-pocket costs, averaging between $2,500 and $3,500 (Meoli, 2016). After a candidate has achieved licensure, CPAs must meet continuing education requirements defined by their licensing state board of accountancy to maintain their license. Most jurisdictions require 80 hours of continuing education every two years with minimum annual requirements in accounting, auditing, tax and ethics. These continuing education costs can range from hundreds to thousands of dollars.

Employers are offering incentives to new accounting hires in an effort to minimize the cost obstacle. Some employers pay for CPA review courses before new hires even start.
Others have offered sabbatical programs, up to one year, where new hires receive a percentage of their salary and time off to study (Meoli, 2016). Charron and Lowe's (2009) survey of 181 accounting alumni found that 75 percent of public accounting firms offer some form of incentives with salary increases and bonuses being the most popular. Forty-one percent offered paid time off to take the exam, 40 percent reimburse examination fees, and 36 percent reimburse review courses. Only 15 percent of new accountants working in public accounting and 36 percent of accountants working in non-public accounting roles reported that their employers did not provide incentives. While the costs are high and financial incentives are common, they do not appear to significantly affect accounting students’ intentions to take the CPA examination. Only one student in Trout and Blazer's (2018) survey cited cost as the primary factor for not pursuing the CPA exam. Coe's (2016) survey of 235 upper-division accounting students found that students’ perceptions of the high cost associated with taking the CPA examination did not negatively impact their intention. Financial support from family was not positively associated with intention to take the CPA examination. In addition, Coe found that students are not waiting to take the examination because of perceived financial support from future employers.

**METHODOLOGY & RESULTS**

**Instrumentation**

The questionnaire used in this study was designed to measure how various factors impact an accounting student’s intention to take the CPA examination. It also collected demographic data including gender, GPA, class level, and age. The instrument did not collect participant names or any unique identifier. The questions were designed based on a review of literature and were reviewed by two accounting professors. In addition to asking students if they plan to pursue the CPA designation, the instrument included 28 statements which were initially designed to create seven index variables.

Hard copy and online questionnaires via Qualtrics were administered to participants during the Spring and Fall 2018 semesters. The sample was comprised of 394 accounting students from 13 colleges and universities located in Pennsylvania. A five-point Likert type scale with 1 representing strongly disagree and 5 representing strongly agree to was used by students to rate their agreement with the 28 statements.

**Results**

The sample was comprised of 394 undergraduate accounting students from 13 colleges and universities in Pennsylvania. The gender distribution was half males and half females. The majority of the students were seniors (39%) and juniors (32%).

292 of the 394 students reported that they intend to take the CPA exam. Similar to the total sample, males comprised 51 percent of students who intend to take the CPA exam and 46 percent of students who do not intend to take the CPA examination. The class level composition of each group was also similar with seniors and juniors comprising 71 percent of students who intend to take the CPA exam and 69 percent of student who do not intend to take the CPA exam.

A logistic regression was completed to determine the relationship between demographic variables (gender, GPA, class level, and age) as well as explanatory index variables (continued education, social influence, self-efficacy, intrinsic motivation, extrinsic motivation, and desire to engage in non-technical business activities) and an accounting student’s intention to pursue the CPA examination.
There was no significant association between any demographic variable and intention to pursue the CPA examination. There was no significant association between self-efficacy, extrinsic motivation, and desire to engage in non-technical activities and a student’s intention to pursue the CPA exam. However, three explanatory variables showed a significant association with intention to pursue the CPA exam: continued education (p < .05), social influence (p < .05), and intrinsic motivation (p < .01).

Highest among these was intrinsic motivation. For every unit increase in the intrinsic motivation scale (Likert scale of 1 to 5), an accounting student is 2.37 times more likely to plan to pursue the CPA exam when controlling for other variables. For every unit increase in the social influence scale, an accounting student is 1.75 times more likely to plan to pursue the CPA exam when controlling for other variables. For every unit increase in the continued education scale, an accounting student is 1.51 times more likely to plan to pursue the CPA exam when controlling for other variables.

Continued education, social influence, self-efficacy, intrinsic motivation, extrinsic motivation, desire to engage in non-technical business activities, age, gender, GPA, and class level account for approximately 17.8 to 26.2 percent of the variation in a student’s intention to pursue the CPA designation.

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THE DEMOGRAPHICS OF INCOME INEQUALITY: THE ROLE OF GENDER, EDUCATION AND AGE IN PENNSYLVANIA

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ABSTRACT:

Few issues today raise more questions and debate than the rising level of income inequality in the United States. With rapid technological change, diminished barriers to global competition, immigration and more, income inequality has increased in the United States to levels not seen the Roaring Twenties. Tax policy changes make likely that the increase in income inequality will persist and likely increase. The question remains what does income inequality look like, not overall, but among various demographic groups. This paper will examine inter-age, inter-racial and inter-educational income inequality among households in the state of Pennsylvania based on the head of household’s demographic characteristics. Since different groups are subject to different pressures in the labor market, we demonstrate that individuals will respond differently to the growing pressures of globalization, technological change and immigration. Those with the greatest potential to gain from changes in the economy will find that some do gain while others do not, thus higher within group income inequality.

INTRODUCTION

When it comes to medical outcomes, the common phrase we hear is “your results may vary”. A similar statement could accompany economic outcomes as well. Whether we are discussing income, unemployment, job growth or life expectancy, where you live and your demographic make-up have an important influence on the economy you face and the outcomes you realize.

Individual characteristics play a significant role in one’s ability to take advantage of new market opportunities and to weather the storm of economic challenges. Income inequality overall in the United States has been on the rise for more than 30 years and currently is at a level not seen since the Roaring 20’s. Technological change, globalization and the increasingly competitive economic landscape, the recent housing crisis and Great Recession have all had significantly different impacts on households depending upon numerous factors including education, age, race and geographic location.

While it is common to outline the differences in average level of income or wealth, this paper takes an alternative approach and focuses on the distribution of income within demographic groups. Variation also occurs from one geographic region to another so this paper zooms in on one particular geography, the state of Pennsylvania, and several regions within Pennsylvania. Pennsylvania has been both challenged by increased competition and
industrial restructuring and also seen the beneficial impacts of technological booms especially in natural gas and transportation.

This paper will focus on within group income distribution within the state of Pennsylvania based on gender, race, age, education and geographic location within the state. Using Integrated Public Use Micro-sample (IPUMS USA) data from before the Great Recession (2007) and after (2017), the distribution of family total income is explored in terms of income inequality. Section 1 points out some stylized facts regarding the income and inequality differences before and after the Great Recession. Section 2 outlines findings of past studies. In Section 3, the data used is explained. Section 4 shares the results of analysis of family income distribution by various demographic and geographic groups in Pennsylvania. Conclusions follow in Section 5.

1. WHY DEMOGRAPHICS MATTER

As economists, we track descriptive statistics about the economy with great interest. Monthly or quarterly data releases are met with news articles and movements of the stock market. However, digging deeper reveals that the economy is not simple enough to summarize with a single number, and if we do so, we miss much of the picture of what is occurring.

For example, average household income varies widely by head of household gender, education and race. The median usual weekly earnings of an Asian Male in the US in 2017 were $1207 compared to $690 for a Hispanic male and $657 for an African-American Female (BLS, 2018). Other measures vary widely too including vast differences in wealth with White Americans reported to have $130,472 in average liquid family retirement savings compared to $19,049 for African-Americans and $12,329 for Hispanics (Urban Institute, 2013). While the national unemployment in the US varied in the Great Recession with a peak of 10% in October 2009, an unemployment rate of even 10% is completely unheard of if you are an African American youth who has faced an average unemployment rate since 2000 of 31.7% and a minimum of 18.8% (BLS, 2018).

In addition to personal demographics, we observe that geography has a significant impact on our economic conditions and these differences may be exacerbated by weak economies. While the national unemployment rate accelerated rapidly in the Great Recession, reaching a high of 10% in October 2009 (BLS, 2019), Nevada’s unemployment rate was the highest in the nation at that time with 14.2 percent unemployment while North Dakota’s unemployment rate was only 3.8% (BLS, 2010). Writing in the Journal of Regional Analysis & Policy, Michael Walden (2012) notes that the spread between the highest and lowest state unemployment rates was only 4.6% in 2007 but this spread increased to a difference of 8.3% in February of 2010. We see similar differences within states. For example, 2018 MSA job growth in Pennsylvania was highest in Gettysburg and Chambersburg-Waynesboro with an increase of 3.1% and 2.6% respectively. At the same time, nearby Lebanon experienced no growth and Williamsport’s jobs declined by 1.3% (PA Department of Labor & Industry, 2018).

Another important trend in economic outcomes in the United States is the increase in income inequality. Income inequality, whether measured by wages, total income or the within company gap in compensation, has increased for more than 90 years and the United States has not witnessed income inequality to the current extent in more than 50 years (Stone, Trisi, Sherman and Taylor, 2018). Based on Center for Budget and Policy Priorities data,
Stone et al (2018) notes that the top 1% of households in the United States experienced income gains of 242% since 1979 compared to gains of 46% experienced by the middle 60%.

Wealth inequality has increased at an even greater rate with significant differences also by age, race and education. Wealth inequality increased dramatically during the Great Recession, especially with heavily leveraged middle class households experiencing the consequences of home price decline. Wolff (2017) demonstrates in his NBER Working paper that the top 1% experienced a rate of return of investment 1.44% higher than the middle class during the period 1983-2016, thanks primarily to the greater diversification available to high wealth individuals. In addition, the racial gap in net worth widened between the races during the Great Recession and the young (aged under 35) experienced the brunt of the housing crisis with average wealth declining from 105,500 in 2007 to $57,000 in 2010 (in inflation adjusted, 2016 dollars).

Geography has shown to matter in income distribution as well, with significant variation between US states and counties. The Gini Coefficient, a measure of income inequality which ranges from 0 (perfect equality of incomes) to 100 (if one household earned all the income), varied in 2010 from the low 40’s (Alaska 41.74; Utah 42.61) to values 20% higher (New York 50.1; Connecticut 49.47). The Census Bureau stated in 2016 that income inequality has increased in every state since the 1970’s with the top 1% of earners capturing nearly all of the economic growth in 15 states and at least half of the economic growth in 24 states (Sommeiller, Price and Wazeter, 2016). County by county variation is even greater. Jake Grovum using Pew Research Center Data noted that the top two counties in terms of income inequality could not be more different – from rural La Salle Texas where the top 1% have 55.9% of income to New York County, home of Manhattan, where the top 1% told 53.9% of the total income. In contrast, analysis by Sommeiller, Price and Wazeter (2016) shows that the lowest inequality demonstrated by counties occurs where only 5% of the top income is held by the top 1%.

While interrelationships between demographic factors are important in explaining why these differences exist, the purpose of this paper is exploration of the data and thus no model is proposed. We know that differences in age, education, family composition and work environment all work together to determine a family’s level of income and thus the income distribution, but we also can examine the overall pattern of income distribution within groups to see in what cases incomes are more widely distributed and how that distribution of income changed from before the Great Recession (2007) to after (2017).

2. LITERATURE

Diaz-Gimenez, Glover and Rios-Rull (2011) say it well when they note that “inequality is a slippery topic because of its multi-dimensional nature. People differ in luck, talent, opportunities, earnings, income, wealth, consumption, leisure, bequests and so on.” Examining the Survey of Consumer Finances in 2007 they examine many of the factors included in this study including age and education.

A life-cycle model of age is used to explain a pattern of general increase in Gini by age until the participants reach age 65. During old age, earnings distributions become much more variable while income distribution becomes more equalized. Diaz-Gimenez et al find that income inequality in the United States is monotonically increasing with education. That is, the income distribution is most narrow for those with less than a high school degree and greatest for those who have 4 year college degree or more.
Similar patterns are evident as well in Diaz-Gimenez and Quadrini’s (1997) cover story from Quarterly Review. In this paper, the authors examine the earnings and income of families based on the demographic characteristics of the head of household including age in 5 year increments, worker status (Worker, Self-employed, Retired, Non-worker), Education (Basic, High School and College) and Marital Status (Married, Single parent and Single no dependents). Not only are average incomes noted, but the authors provide Gini Coefficients for each demographic group. Overall, the Gini Coefficient of income increases with age, is highest for high school graduates as opposed to those who did not complete high school or college graduates and is high for singles without dependents.

Mather and Jarosz (2014) also examine the sources of variation in US income and examine the role of racial and ethnic composition, immigration, family composition and age. They find that education is a key factor that separates the top from the bottom within in a society. They, however, do no examine within group inequality as done in this paper.

Oliver and Whitaker (2012) identify that regional variation is important in both income and income inequality. Using Current Population Survey data from 2011, the authors compare descriptive statistics and income distribution in 4 regions of the United States, the Northeast, Midwest, South and West. They point out that regional differences in income and earnings should be small since workers can migrate in search of higher earnings and firms would migrate in order to obtain lower cost labor resources. However, households and firms have connections to their local communities and thus differences are persistent across regions. Overall, income inequality is seen to be the greatest along the coasts and in the deep South and smaller in the mid-section of the country.

Family income at the county level was also investigated by Nielse and Alderson (1997). Using a panel data set and random effects regression with 3000 counties and observations from 1970, 1980 and 1990, the authors examine the influence of female headed households, economic growth, increases in manufacturing, racial dualism of the county, unemployment and more. Higher incomes are found to lower intercountry inequality. Urban areas and those with greater racial diversity have higher inequality.

Moller, Anderson and Neilson (2009) expands on inter-county variations in family income inequality with a model that includes county, state and cross-sectional characteristics. With the use of state specific factors, the authors consider institutional and political influences on family income inequality at a county level including policies such as minimum wage. They also consider labor market and demographic factors. Similar to this paper, gender, race and education are considered as determinants of income inequality in geographic areas.

Moller, Anderson and Neilson clarify the role of various causes of the increase in income inequality in the US. One branch of literature attributes the growth of earnings and income inequality in the United States to skill-based technological change. Highly educated workers experienced an increase in labor demand while those with lower skills experience a decrease in labor demand. Globalization is explored in another branch of literature which again points to downward pressure on some wages and income while offering greater profitability to others. Since workers of different education, age and gender may be positively or negatively influenced by these shocks, income inequality will rise. Finally, county specific characteristics related to economic development may have a role in explaining the differences in income distribution observed.

In this paper, the descriptive statistics related to income inequality in one geography, Pennsylvania, will be examined. While no model will be estimated, the descriptive statistics
point to significant variations in family income distribution consistent with the above literature.

3. DATA

The data used come from the U.S. Census Bureau Annual Social and Economic Supplement. This survey of 75,000 households includes both detailed demographic information on the individual and their household and income variables. The Integrated Public Use Micro-sample USA was used to study family income for 2007 and 2017. While data is available for all of the United States (with approximately 180,000 households each year), we focus here on a subset for the state of Pennsylvania. Restrictions are made to examine adult heads of household (age 18 or older) who have at least family income of $2500 in the sample year and group housing facilities are eliminated so that the maximum number of adults in a household is 6 (accounting for 99.8% of all households). While focusing on Pennsylvania alone reduces the availability of household data considerably, the analysis recognizes the key differences that may exist across the country. Data is weighted using the Census supplied weighting factor for households except during calculation of the Gini Coefficient within groups. The final sample size is N=4034 in 2007 and N=3167 in 2017.

The dependent variable of interest is the distribution of one of several household level income statistics, the Family Total Income. This variable captures total pre-tax money income earned from all sources by all members of the family unit in the previous year. In addition to wages, this value includes public assistance, retirement income, social security and pensions, self-employment and farm income and unemployment compensation. Since we are considering the income distribution across many age groups, including those 65 or older, total income as opposed to wages is the appropriate indicator. Income earned up to $49,999 is rounded to the nearest 100 and income over 50,000 is rounded to the nearest 1000. Unlike data from the CPS IPUMS, there is no top code for this statistic making it particularly appropriate for measures of income distribution, especially with the growth of income of the top 1%. Income from 2007 is inflation adjusted based on the national Consumer Price Index in March 2007 and March 2017.

Because of the extreme values at the upper end of the distribution, we examine median income and the quartile distribution. Actual money income is used in the calculation of the Gini Index, another commonly used measure of income inequality. As such, the Gini is more sensitive to the extremes of the income distribution.

Inter-group distribution is examined through the characteristics of the head of household. While imperfect in the sense that the family’s income also depends on the characteristics of others in the house, family income also is the best measure of the actual purchasing power of a group of people. The characteristics examined in this paper are:

- Gender: Male and Female Head of Household. Gender differences in earnings are commonly found so it is anticipated that the average family income will be lower for female-headed households. The distribution of income by gender is also examined.

- Age: Age of Head of Household as classified as Age 18-34, Age 35-49, Age 50-64 and Age 65+ Overall, income tends to increase with age though at a declining rate. Income will be lower among the oldest category capturing retirees. The distribution of income also varies as opportunities for gains and the impact of economic events has different impacts on different ages. Those at the youngest and oldest ages may demonstrate the most
heterogeneity since some may be working while others are not. Previous studies have found the income distribution to widen with age.

Race: Race of Head of Household as classified as White, Black, Asian and Other. Bi-racial and multi-racial individuals and American Indian, Pacific Islander are classified as other. There is no accounting for bi-racial or multi-racial households since only the characteristics of the head of household are available. Average income will vary by race with Asian expected to demonstrate the maximum income and Black the lowest. The ability to take advantage of economic opportunities and to adapt to economic environment change will vary due to differences in education, location and discrimination.

Education: Educational Attainment of the Head of Household classified as Basic, High School, Some College, Bachelors Degree and Post-Bachelors Education. Basic education is defined as a maximum educational attainment of 11th grade. High School measures those who have completed the 12th grade or its equivalent. Some College indicates at least one year of college but not earning a Bachelors Degree. Those will Associate degrees are included in some college. Bachelors degree signifies the earning of a Bachelors (4 year) degree and Post-Bachelors captures a variety of after Bachelors degree professional degrees as well as doctorate degrees. Both the level and distribution of income will depend upon the education of the head of household. In addition, those at lower levels of education are more likely to experience unemployment or remain unemployed longer. The ability to profit from economic opportunities and to withstand economic downturns will be related to education.

Region: Counties of Pennsylvania are used as a measure of geography. Physical location is not noted for all sample participants – if the county has a small sample size, the county variable is not provided for that household to preserve anonymity. Counties are combined into 4 broad regions for Pennsylvania. These are North (Monroe, Schuylkill, Erie, Mercer), Southeast (Bucks, Chester, Delaware, Montgomery, Philadelphia), South Central (Berks, Dauphin, Franklin, Lancaster, Lycoming, York) and Southwest (Allegheny, Beaver, Blair, Butler, Cambria, Washington, Westmoreland). Note that some counties are not included in the data set due to a small number of survey participants. These will be investigated with a larger sample in a future project. The growth of natural gas fracking in Northeastern Pennsylvania as well as changing employment opportunities in other areas of the state (notably the South Central corridors) will likely contribute to both different levels of income and different distribution.

4. RESULTS

Table 1 presents sample statistics for Pennsylvania families in 2007 and 2017 as well as the comparable national IPUMS sample. In addition to current 2007, median and mean family income in 2007 is also presented as inflation adjusted to 2017 dollars, making this comparable with the latter sample.

(TABLE 1 APPROX HERE)

Overall median family income in PA has increased, even in inflation adjusted terms. This is consistent with the national pattern. We also see that the Coefficient of Variation of Total Family Income has increased significantly, consistent with an increase in income inequality. The variability of Pennsylvania family income has increased by 16.66% which is much larger than the national change.
The percentage of female-headed households is the same over time and compared to the national sample. The age distribution of Pennsylvania households tends to be slightly older than the national sample and Pennsylvania has gotten slightly older. This is not surprising with the aging of the baby boomers and it has mimicked the national pattern.

Pennsylvania is less racially diverse than the nation. The percentage white has fallen in Pennsylvania between 2007 and 2017. Finally Pennsylvania shows more family heads who have a high school education compared to the nation as a whole with 41% of the family heads having a high school education in 2007. In 2017, more family heads have a bachelor degree and the education distribution is very similar to the national sample. Pennsylvania in 2017 continues to show fewer family heads with an Associate Degree (or some other education in excess of high school but less than a bachelor degree).

Table 2 focuses on Income Distribution by presenting the Gini Coefficient by demographic group in Pennsylvania.

(TABLE 2 APPROX HERE)

The increase in median family income from 2007 to 2017, including while adjusting for inflation, is seen throughout the table with a few exceptions. The family heads between 35 and 64 have experienced the greatest growth in inflation adjusted family income. Also those with high school education have lost ground between 2007 and 2017 while those a bachelors degree just held on with no significant increase in median family income. Those with a graduate degree have seen a sizeable increase in inflation adjusted family income (accounting for the majority of the increase).

Almost all measures of income inequality have increased from 2007 to 2017 in Pennsylvania.

The increase in inequality (an increase in the Gini coefficient value by 4) has been very similar for male and female headed families. Female headed families continue to demonstrate higher income inequality than male headed families, no matter how you measure the inequality.

Families headed by those aged 65 or older have experienced a decrease in inequality between 2007 and 2017 as measured by the Gini Coefficient. Since the Gini Coefficient in calculated with unweighted data and the sample size is small, this result should be taken with caution. However, with the significant decline in housing value and stock market based savings and investment, it is not surprising that the Gini coefficient for the oldest households would decrease.

Those with basic education experienced a small decrease in inequality. This group of the population has decreased in size over time and may constitute a good many older or very young household heads. All other age groups demonstrate an increase in income inequality between 2007 and 2017. The increase in fairly proportional, though slightly larger for those in the 50-64 age group. This group may be most impacted by technology and trade related changes in the income distribution – presenting an opportunity for those in management and a threat to those with import competing skills.

The income inequality of whites increased significantly in Pennsylvania with an increase in the Gini Coefficient from 41.40 in 2007 to 25.85 in 2017. For Black and Asian family heads, the income inequality measures show a slight decrease in income inequality to values that are more similar to white family heads.
Finally, we see that income inequality for those with a high school through Bachelors degree education increased as measured by the Gini Coefficient. The growth in income inequality was very significant for those with some college education with an increase in the Gini Coefficient from 37.9 to 44.4. This outpaced all other education groups. The income distribution did not change for those with Post-Bachelor degree education and those with less than a high school education see a slight decrease in inequality.

Table 3 considers changes in the population in Pennsylvania by regions. Some counties are not represented here as the sample size was small and the Census does not supply county identifier for all participants. Percentages are calculated on the basis of participants available. Even with this limitation, differences between regions and changes over time are strongly evident.

(TABLE 3 APPROX HERE)

The percentage of female-headed households is slightly higher in the Southeastern region (which includes Philadelphia). The growth of families headed by those age 65 or older is very large, though slightly smaller in the Southwest (which includes Pittsburgh). Overall, the Southeast is slightly younger than the rest of Pennsylvania. In terms of race, the Southeast is considerably different from the rest of Pennsylvania though the growth of minority populations has been high in the Southwest.

Finally, there are significant differences by educational attainment between the regions. The North and Southcentral (the more rural parts of the state) have fewer individuals with a Bachelors degree or graduate degree. High School and Some College education dominate in these regions with more people obtaining some college in the Southcentral region in later years.

(TABLE 4 APPROX HERE)

Table 4 provides the median family income and income inequality in 4 regions of Pennsylvania. Pennsylvania’s economy has undergone significant changes from 2007 to 2017 with increased globalization and competition in some industries and the rapid growth of the natural gas fracking in some regions of the state.

Median family income is significantly lower in the Northern region in 2007 but is much larger in 2017. In addition, income inequality increased very dramatically between 2007 and 2017 in this region. The Southcentral region of Pennsylvania has experienced a decrease in inflation adjusted median family income. In 2007, it had the most equal distribution of family income and the extent of income inequality has increased dramatically between 2007 and 2017. Similar to the tendency for rural regions to have more equal distributions of income, we find higher income inequality in the Southeast which is the most urban area. Inequality remained fairly constant in the Southwest of Pennsylvania and increased by 3 points in the Southeast.

(TABLE 5 APPROX HERE)

Conclusions
Variations in income inequality are evident in Pennsylvania. The patterns suggest that those who are in mid-career and those who have moderate skills (high school and some college) experienced the greatest growth in income inequality. Some families have been able
to navigate the post-recession economy while others have struggled in these age and education groups. In addition, the income differences among the oldest have fallen greatly with a much smaller Gini Coefficient among the families with a head over age 64. The loss of income from savings and housing had a significant impact on this group during the recession.

Geographic variation is also evident in even this small sample of Pennsylvania counties. The Southcentral region of Pennsylvania, which is more rural than the Southeast and Southwest, demonstrated the lowest amount of income inequality. The biggest increase in inequality occurred in the Northern part of Pennsylvania and this is the area that has been subject to rapid change in the natural gas industry.

A more complete analysis of Pennsylvania counties requires the use of additional ASEC supplements from IPUMS and this is a continuing project. Future work will also examine a full national geography and political and social values within these areas with different income distributions.

REFERENCES


Table 1. Sample Statistics Overall, Pennsylvania and United States

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<td>Median Family Income</td>
<td>$54,590</td>
<td>$64,536</td>
<td>$52,400</td>
<td>$61,947</td>
<td>$72,593</td>
<td>$67,044</td>
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<td>CV Family Income</td>
<td>0.96</td>
<td>1.05</td>
<td>1.12</td>
<td>1.07</td>
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<tr>
<td>Male Headed</td>
<td>47.50%</td>
<td>47.70%</td>
<td>47.20%</td>
<td>47.80%</td>
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<tr>
<td>Female Headed</td>
<td>52.50%</td>
<td>52.30%</td>
<td>52.80%</td>
<td>52.23%</td>
<td></td>
<td></td>
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<tr>
<td>Age 18-34 Years</td>
<td>26.10%</td>
<td>28.90%</td>
<td>25.60%</td>
<td>27.60%</td>
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<tr>
<td>Age 36-54 Years</td>
<td>26.90%</td>
<td>29.70%</td>
<td>23.50%</td>
<td>25.10%</td>
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<td>Age 55-64 Years</td>
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<td>25.80%</td>
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<tr>
<td>Age 65+ Years</td>
<td>19.50%</td>
<td>16.90%</td>
<td>24.70%</td>
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<td>White</td>
<td>88.80%</td>
<td>82.20%</td>
<td>84.20%</td>
<td>78.90%</td>
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<tr>
<td>Black</td>
<td>8.90%</td>
<td>11.10%</td>
<td>10.00%</td>
<td>11.90%</td>
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<tr>
<td>Asian</td>
<td>1.60%</td>
<td>4.50%</td>
<td>4.20%</td>
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<td>Other</td>
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<tr>
<td>High School</td>
<td>41.50%</td>
<td>32.90%</td>
<td>34.30%</td>
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<td>Education Level</td>
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<tr>
<td>Some College</td>
<td>21.90%</td>
<td>27.20%</td>
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<tr>
<td>Bachelors</td>
<td>16.70%</td>
<td>18.00%</td>
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<td>Post-Bachelors</td>
<td>8.30%</td>
<td>9.10%</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td></td>
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<tr>
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<td>3,167</td>
<td>126,166</td>
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</table>

Source: IPUMS USA ASEC 2007 and 2017
| Demographic | 2007 Family Total Income | | | 2017 Family Total Income | | |
| --- | --- | --- | --- | --- | --- |
| | N | Median | Median (2017$) | GINI | N | Median | GINI |
| Overall | 4,033 | $54,590 | $64,536 | 42.70 | 3,167 | $72,593 | 46.53 |
| Male | 1,901 | $57,511 | $67,990 | 40.86 | 1,488 | $77,500 | 44.59 |
| Female | 2,132 | $51,000 | $60,292 | 44.27 | 1,679 | $67,198 | 48.05 |
| Age 18-34 | 1,064 | $54,500 | $64,430 | 43.39 | 805 | $66,003 | 45.62 |
| Age 35-49 | 1,280 | $64,645 | $76,423 | 39.92 | 869 | $87,624 | 41.98 |
| Age 50-64 | 1,016 | $66,610 | $78,746 | 40.14 | 794 | $89,600 | 45.80 |
| Age 65+ | 673 | $30,764 | $36,369 | 41.53 | 699 | $46,951 | 38.07 |
| White | 3,492 | $57,000 | $67,385 | 41.40 | 2,619 | $74,684 | 45.85 |
| Black | 426 | $35,000 | $41,377 | 48.13 | 333 | $50,000 | 45.65 |
| Asian | 74 | $50,000 | $59,110 | 47.42 | 162 | $82,226 | 46.52 |
| Basic | 460 | $30,112 | $35,598 | 48.19 | 302 | $41,153 | 47.17 |
| High School | 1,654 | $46,202 | $54,620 | 40.43 | 1,057 | $52,000 | 44.91 |
| Some College | 906 | $58,076 | $68,658 | 37.89 | 733 | $71,551 | 44.42 |
| Bachelor | 679 | $84,088 | $99,409 | 35.35 | 682 | $98,010 | 40.99 |
| Post-Bachelor | 334 | $100,000 | $118,220 | 40.38 | 393 | $129,672 | 38.50 |
Table 3. Demographic Characteristics in Pennsylvania Regions

(percentage of respondents)

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<thead>
<tr>
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<th>Male 2007</th>
<th>Male 2017</th>
<th>Female 2007</th>
<th>Female 2017</th>
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<td>51.4</td>
<td>51.6</td>
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<td>48.9</td>
<td>46</td>
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<table>
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<tr>
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<th>Age 18-34 2017</th>
<th>Age 35-49 2007</th>
<th>Age 35-49 2017</th>
<th>Age 50-64 2007</th>
<th>Age 50-64 2017</th>
<th>Age 65+ 2007</th>
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<tr>
<td>Northern</td>
<td>21.4</td>
<td>23.3</td>
<td>32.5</td>
<td>24.6</td>
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<td>23.8</td>
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<td>28.2</td>
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<td>24.1</td>
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<td>28.2</td>
<td>28.3</td>
<td>25.8</td>
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<td>25.1</td>
<td>17.8</td>
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<td>Southwestern</td>
<td>26.9</td>
<td>27.2</td>
<td>25.3</td>
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<td>28.1</td>
<td>28.6</td>
<td>19.7</td>
<td>22.9</td>
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</thead>
<tbody>
<tr>
<td>Northern</td>
<td>95.9</td>
<td>86.4</td>
<td>3.2</td>
<td>6.0</td>
<td>0.9</td>
<td>5.1</td>
</tr>
<tr>
<td>Southcentral</td>
<td>95.6</td>
<td>93.1</td>
<td>2.5</td>
<td>4.0</td>
<td>1.2</td>
<td>1.9</td>
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<tr>
<td>Southeastern</td>
<td>74.2</td>
<td>72.0</td>
<td>22.1</td>
<td>19.2</td>
<td>2.8</td>
<td>7.1</td>
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<tr>
<td>Southwestern</td>
<td>93.2</td>
<td>84.1</td>
<td>4.1</td>
<td>9.4</td>
<td>1.9</td>
<td>4.8</td>
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<tr>
<td>Northern</td>
<td>14.8</td>
<td>10.8</td>
<td>35.2</td>
<td>41.3</td>
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<td>Southcentral</td>
<td>14.6</td>
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<td>47.2</td>
<td>38.5</td>
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<td>11.9</td>
<td>8.3</td>
<td>37.3</td>
<td>28.2</td>
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<td>7.6</td>
<td>3.7</td>
<td>27.6</td>
<td>29.5</td>
<td>27.7</td>
<td>26.3</td>
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Table 4. Median Family Income and Distribution by Region

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<tr>
<td>Northern</td>
<td>146</td>
<td>$49,760</td>
<td>$58,826</td>
<td>37.12</td>
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<tr>
<td>Southcentral</td>
<td>591</td>
<td>$60,346</td>
<td>$71,341</td>
<td>36.89</td>
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<td>Southeastern</td>
<td>1,214</td>
<td>$57,520</td>
<td>$68,000</td>
<td>45.61</td>
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<tr>
<td>Southwestern</td>
<td>851</td>
<td>$56,232</td>
<td>$66,478</td>
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<td>2,802</td>
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<tr>
<th>2017 Family Income</th>
<th>N</th>
<th>Median</th>
<th>Gini</th>
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<tr>
<td>Northern</td>
<td>264</td>
<td>$76,780</td>
<td>47.25</td>
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<tr>
<td>Southcentral</td>
<td>577</td>
<td>$59,535</td>
<td>44.86</td>
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<tr>
<td>Southeastern</td>
<td>1,003</td>
<td>$77,500</td>
<td>48.38</td>
</tr>
<tr>
<td>Southwestern</td>
<td>539</td>
<td>$75,048</td>
<td>43.73</td>
</tr>
<tr>
<td></td>
<td>2,383</td>
<td></td>
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</tbody>
</table>

Northern: Monroe, Schuylkill, Erie, Mercer
Southcentral: Berks, Dauphin, Franklin, Lancaster, Lycoming, York
Southeastern: Bucks, Chester, Delaware, Montgomery, Philadelphia
Southwestern: Allegheny, Beaver, Blair, Cambria, Washington, Westmoreland

Note some counties are omitted from CPS County due to small sample sizes in those counties.
Table 5. *Family Income Distribution, 2007 and 2017 by PA Region*

Southeastern and Southwestern (urban areas) show little change in family income distribution between 2007 and 2017.

<table>
<thead>
<tr>
<th>Southeastern PA</th>
<th>Southwestern PA</th>
</tr>
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<tbody>
<tr>
<td>SE 2007</td>
<td>SE 2017</td>
</tr>
<tr>
<td>Cumulative % of Income</td>
<td>Cumulative % of Income</td>
</tr>
<tr>
<td>Cumulative % of Population</td>
<td>Cumulative % of Population</td>
</tr>
</tbody>
</table>

Southcentral and Northern Pennsylvania show large increases in family income inequality between 2007 and 2017.

<table>
<thead>
<tr>
<th>Southcentral PA</th>
<th>Northern PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC 2007</td>
<td>SC 2017</td>
</tr>
<tr>
<td>Cumulative % of Income</td>
<td>Cumulative % of Income</td>
</tr>
<tr>
<td>Cumulative % of Population</td>
<td>Cumulative % of Population</td>
</tr>
</tbody>
</table>
THE CONTINUED PROGRESSION OF SWEDEN’S SUSTAINABLE (GREEN) ECONOMY

Timothy L. Wilson
Lars Lindbergh
Umeå School of Business, Economics and Statistics
SE 901 87 Umeå, Sweden

ABSTRACT

The task of implementing Sweden’s strategy for sustainable development has had a holistic approach and the State has played a major role in its development. The framework for this paper comes from a recent publication that associates sustainability with Zhang and London’s modified Porter model and discusses current Swedish developments in municipal public housing, domestic air transportation and wood products. Insofar as Sweden might be a model for extending efforts in sustainable development, observations here provide some insight into possible approaches and results, particularly so in the U.S. current interest in a “Green Bill of Rights”.

INTRODUCTION

It has been our past practice to come to the PEA annual conference and report on our research of the continued development in municipal public housing in Sweden (cf. Wilson and Lindbergh, 2018). We think these presentations were favorably received because of Sweden’s social democratic approach to its national economy. Within this approach, municipal housing in particular is “public”, but not “social”. Put another way, allowances in the Swedish system are not made by income, but rather by need, and public housing in the Swedish system is thus universally accessible. As a consequence, it has avoided some of the problems associated with social housing across Europe and the U.S.

This year we come again, to not only discuss current developments in municipal public housing, but also to reflect upon sustainability in Sweden in general, particularly the domestic air transportation and wood products sectors. The framework for this paper comes from a relatively recent publication that associates sustainability with Zhang and London’s (2013) modified Porter model (Lindbergh, Jacobsson and Wilson, 2016). The task of implementing Sweden’s strategy for sustainable development has followed a holistic approach and the State has played a major role in its development. That is, sustainability is the responsibility of the Government Offices as a whole, which produces proactive programs in each of the interactions analyzed in the Zhang and London modified model. As an aside, the country has sustained a high level of competitiveness while producing a pleasant environment in which to live (Robecosam, 2018). Insofar as Sweden’s approach might be a model for other countries interested in extending their efforts in sustainable development, observations here provide some insights into possible approaches and results. This paper is
relevant to a PEA audience because of the current interest and the present discussion of a “Green Bill of Rights” in the U.S.

BACKGROUND

Previous Work on Sustainability in Sweden

Sweden is not only considered a leader in sustainable, industrial practices but at least one commercial enterprise considers it the leader (Robescosam, 2018). Our most recent work has dealt both with Swedish sustainability in general (Lindbergh et al 2016) and with municipal housing in particular (Lindbergh et al 2018, 2017). As a foundation of the 2016 paper, we suggested that Sweden has pursued a dedicated path toward greater sustainability and indicated some examples of sustainable developments in that progress (see Figure 1). Early background in that progress came from the concept of sustainable development itself (1987) and the UN World Summit in Johannesburg (2002). The Swedish Strategy for Sustainable Development (SSSD) was developed and formally presented a year later (2003). The work on water quality (2007), jobs and growth (2007), green corridors (2010) and mineral strategy (2011) were cited as evidence of the country’s cooperative progress. In the development of this story of Sweden’s approach to State sustainability it was recognized that there were other sectors in which effort was likely. Thus, the diagram showed empty boxes where those cases could be entered (see Figure 1 again). This paper takes the step forward in filling those boxes. With regard to municipal housing, both management’s intentions (2017) and actual results (2018) indicated a strong support for the development of sustainability within that sector.

Concept of a Green New Deal in U.S.

At this point in time (spring 2019), a Green New Deal is substantially a political statement. Nevertheless, it has been characterized as a four part program for “moving America quickly out of crisis into a secure, sustainable future” (Summary, 2019). Supporters suggest that it is “Inspired by the New Deal programs that helped us out of the Great Depression of the 1930s, the Green New Deal will provide similar relief and create an economy that makes our communities sustainable, healthy and just”. The tenants of this development are outlined below. In comparison, it could be argued that the concept bears a remarkable similarity to the welfare states in Europe, particularly the Scandinavia and in our case Sweden. For instance, statements concerning

- Workers’ rights: “including the right to a living wage, a safe workplace, to fair trade and organize a union at work with fear of firing or reprisal”. Recall that in general, Sweden has a heavy union tradition to the extent that even tenants and students are unionized.
- Tuition-free education: “a tuition-free, quality, federally funded, local controlled public education system from pre-school through college”. Private, professional programs face a difficulty insofar as they require student funding, which is difficult to support under Swedish regulation.
- Affordable housing: “the right to decent affordable housing, including an immediate halt to all foreclosures and evictions”. Note that one of the unique
characteristics of Swedish public housing is its availability to anyone regardless of income.

- Universal health care: “quality health care which will be achieved through a single-payer Medicare-for-all program”.
- Ecologically sustainability: the “investment in sustainable nontoxic materials, closed-loop cycles that eliminate waste and pollution, as well as … sustainable forestry.

METHODOLOGY

The research was both exploratory and qualitative in nature and utilized an in-depth case study approach to the Swedish international economy. The approach basically followed Siggelkow’s (2007) definition of the use of cases as illustrations. That is, selection of the country was not random, but very special in the “sense of allowing one to gain certain insights that other organizations would not be able to provide”. Examples of activity were selected that provided association, thus the foundation for analysis provided by Zhang and London’s (2013) modified Porter model. The criteria for selection were:

- The illustration had to be clearly Swedish and directly applicable to the Zhang and London (ZL) description of the sustainability – other factor interaction.
- A secondary source had to be available describing the example, preferably in English.
- The example had to be directly associated with the ZL sustainability – other factor interaction. For instance, the work in Sweden relating to the natural resource interaction associated with sustainable developments in wood and forestry as related to government, demand and (especially) support industries.

Information was drawn from current secondary sources (Government Offices of Sweden, Regeringen reports for various years and topics, Statistics Sweden, available World Bank data and because of the current nature of the changes, internet information on the development. These sources have been complemented by personal contemporaneous observations and conversations with individuals in Sweden.

OBSERVATIONS

Ongoing Development: Municipal Public Housing

We have been following the progress of Municipal Public Housing for at least the past fifteen years and have routinely reported on our observations at PEA conferences (see reference list of Lindbergh et al PEA conference papers, 2018). It is a topic of particular importance because of the impact this sector has on Swedish GDP and the influence it has on Swedish housing policy and practice. Beginning in 1950 almost all municipalities set up their own independent housing companies. These companies were non-profit organizations in which the municipalities held all the shares. The municipalities had to provide the whole of the capital, normally 1.0% of the production costs of construction. Otherwise, the organizations borrowed all the capital required for housing construction or renovation in the capital markets. Their only source of income was their rents, so they had to reserve funds for capital costs, administration, maintenance, and development. It was in this area that some concerns were addressed. Planning legislation gave the municipality the sole right to land
use and the municipality thus decided when and where housing was to be built. The
municipality also granted building permits for housing and other construction under
provisions of the legislation. It (the municipality) also could issue financial guarantees for
construction as a form of subsidy. The municipality and/or company decided on rules for
housing allocation. Need was the common criterion; maximum income was never used. At
one time the municipalities were responsible for housing allocation, but now this task is
increasingly being taken over by the companies themselves.

Public housing under Swedish policy is universally accessible and allowances are not
made by income level, but rather the need for housing. Nevertheless, in July 2002, the
European Property Federation lodged a complaint with the European Commission, objecting
to the Swedish practice of allocating state aid to the housing of “well-off people”. After a
State inquiry and significant debate, the Swedish parliament abolished public service
compensation for municipal housing companies in order to maintain the principle of
universal access. The Municipal Housing Act, which entered into force on 1 January 2011,
liberalized the sector and set out the objectives and ground rules for public housing
companies. The State’s aim was to promote public benefits and the supply of housing for all
kinds of people (still) and/but Municipal Public Housing Companies needed to operate under
“business-like principles”. Under the new legal framework, public companies should charge
market rents, including a certain profit margin. Furthermore, municipalities should require
a market rate of return on investment, reflecting industry practice and level of risk.

In the promulgation of Municipal Housing Act of 2011 it was not explicitly noted, but
undoubtedly assumed, by legislators that the municipal sector of housing would proceed
much as before. That is, municipalities would continue to promote public benefits and the
supply of housing for all kinds of people. The only difference would be the “business-like”
addition to activities. To be sure adjustments were of course anticipated, but Swedish
residents would continue to be largely content with their housing system. The European
Property Federation and the European Commission, however, would be off the State’s back.
As is frequently the case in examples of New Public Management applications, however,
there can be unexpected results. In the Swedish example, one change had to do with the
relationship between public and private housing provision. Until MHA 2011, rents were
negotiated between the local Union of Tenants and MHCs, which were also binding upon
the private sector and thus further affected the importance of MHCs. Nevertheless, because
of MHA 2011 private landlords have been equal parties in negotiations and sign their own
agreements with unions – business-like in this context could include price competition,
something rather new to this sector. Further, market rents, profit margins, rates of return on
investment and levels of risk had companies analyzing and reassessing their operations. In
effect, these companies were pushed into decision making situations that had few, if any,
historical precedents and are likely going through a paradigm shift in their operations.

Presently, as the industry goes further, new construction has not kept pace with
population growth particularly in the larger cities; in all three major metropolitan areas, the
increase in the number of finished residential properties has only been one-fifth of the
population increase. According to the latest survey carried out by the National Board of
Housing, Building and Planning, 240 out of 290 local municipalities have a shortage of
housing. The average wait time for a Stockholm County apartment has grown to 9.1 years.
For a contract on a city-center apartment, the wait is 13.5 years. Immigration of course has
accentuated the capacity problem. A regulation introduced in 2016 meant that municipalities
were required to house more than 20,000 immigrants who have been distributed throughout
the country. Whatever the case, the situation is not the same everywhere; individual companies have entered this period facing different local environments and with different resources. All firms in the industry have not adopted the same strategy, nor should they. Nevertheless, those that possess superior resources and make appropriate decisions in their adaption might be expected to do well. Those that have not and/or do not – not so well.

The municipal housing landscape has shifted toward becoming more competitive within the local communities. As the sole stockholders of MHC shares, the municipalities themselves have dual concerns. First, are the financial concerns that any stockholder has for their share ownership, i.e., what are the anticipated cash flows likely to be that determine the present value of their holdings? Second, are the sociological concerns, i.e., to what degree are the housing needs of our residents being met? The answer to the first question is no longer academic insofar as properties have been changing hands (Wilson and Lindbergh, 2018). The second one is critical because housing availability determines to some degree economic stability and growth; put another way, people need places to live in the area in which they work. Effectively, the unanticipated consequence of MHA 2011 has produced a step toward deregulation of the public housing market. Insofar as the movement has occurred from a rather protective base to one that is now more competitive, this shift may be regarded as a problem for them. In particular, privatization has produced a changing industry and we may be seeing a shakeout in progress. Consequences of horizontal alliances, i.e., cooperation among adjoining MHCs can be anticipated as well as the vertical ones of public-private affiliations.

Changes in the housing market and its environment are creating new challenges for the public housing sector in Sweden. In addition to its core activity – building and managing rental dwellings for everyone – Public Housing Sweden (formerly SABO), a trade association of about 300 Municipal Public Housing Companies, has developed a position paper to guide future MHC policy. It suggests that the public housing sector needs to develop its role as a community developer and facilitator. To support this work, Public Housing Sweden, the Swedish association of public housing companies has produced a concept programme in dialogue with its member companies, entitled The Public Housing Sector Moving towards 2030. This effort’s overall goals are (1) a fossil free public housing sector by the year 2030, and (2) 30 percent lower energy use by 2030 (Långström et al, 2019).

By regulation, MHCs are required to renovate their apartments every 11 years. The degree of renovation is developed in consultation with the local tenants union and generally includes inspection and reflection of counter tops, flooring and wall covering. Partially as a consequence of MHC’s observation as well as the probable inevitability of a sustainability regulation, a local housing company has initiated a renovation project that includes elements of sustainability. In “Reflections on Sustainable Álidhem: A Case Study in Swedish Municipal Public Housing Refurbishment” (Lindbergh et al, 2018) a 43% improvement was observed in energy utilization in the pilot building compared to its reference companion (99.8 vs 174.5 kWh/m² per year). The pilot project of the local company did not include all the changes made in the Álidhem case, but it did include some important energy saving features, primarily new windows, doors and energy monitoring devices (Långström et al, 2019). See Table 1.

“New” Development: Rationalization of Domestic Airline Transportation
Swedes frequently refer to their country as “small”. Realistically, that description can be accepted only in terms of population; it is a country of about 10 million people. In terms of land area, however, it is large; North to South, it measures about 1000 US miles. Consequently, air travel developed early in the country and residents have become accustomed to flying. Stockholm is the major hub of course, but Gothenburg and Malmo are centers to which business people, as well as tourists, routinely travel. Umeå, our location, is about 400 US miles north of Stockholm and is thus about one hour away by air. On a typical weekday, SAS, the dominant carrier, and its two smaller competitors each make four flights a day – one hour south, starting at about 7:00 AM, turnaround and one hour back – four times for each.

Aviation is responsible, however, for about 3%-8% of the world’s total carbon emissions, according to numbers from the US Government Accounting Office. That’s more than South Korea’s total carbon emission. As early as 2016 the Swedish Social Democrat-Green Party government considered a climate tax on flights as part of its budget - a move that would hike ticket prices. The Swedish government has said that a dramatic uptick in the number of airline passengers is behind their tax. That tax was implemented in April 2109. Under current Swedish rules, airlines pay value-added tax of 6 percent on domestic flights while international flights are exempt from VAT. The new airline tax is meant to compensate for the lack of VAT on international flights and for the low price airlines pay for greenhouse-gas emissions.

The hope is that by levying a fee of roughly $3-$49 per passenger, depending on the flight’s destination, Sweden’s government can decrease the country’s number of airline passengers. Implicit in this presumption is that fewer passengers would result in fewer flights, which would mean a decreased carbon output. Swedish officials originally predicted that the tax would mean 450,000–600,000 fewer flyers in the country per year, which would mean roughly a 2% reduction in Sweden’s carbon emissions. In our Umeå example, for instance, instead of four flights a day, perhaps we might have to make do with three, or perhaps the smaller competitors might abandon the service.

A recent report from the World Wildlife Fund (WWF) has revealed that 23% of Swedish people have decided not to fly in the past year because they perceive it to be bad for the environment. International flight growth has been cut in half (4%) compared to (9%) historically. At the same time, 188,000 fewer passengers in Sweden took domestic flights: a drop of three percent. At least one route has already been eliminated due to the fee — Norwegian Air’s flight from Karlstad (KSD) to Alicante (ALC). Norwegian also told the Swedish government that the tax might interfere with the carrier’s goal of making Stockholm one of its major hubs, Business Insider Nordic reports. This phenomenon has gone so far as to even add new words to the Swedish vocabulary. One such word is “flygskam”, meaning flying shame; another is “smygflyga”, meaning flying in secret. They have also invented a word for those who post on social media whilst taking the train; “tagskryt”, meaning train bragging.

“New” Development: Wood Building

It has become popular in the U.S. to talk about “flyover” country, i.e., that portion of the country between the east and west coasts. A lot of U.S. flyover is farmland. In Sweden, flyover is forests – lots of it; up to 70 (68.9) percent of the country or 108 thousand square miles (the equivalent of the state of Nevada) is woodland. Forestry and its auxiliary
industries make up an appreciable portion of Sweden’s goods production sectors, e.g., machinery, furniture and paper production – plus exports. There is a long history going back to 1903 of state regulation of privately owned forests that promote afforestation and stand management to sustain yields and maintain supplies for industrial users.

It may seem counter-intuitive to think about sustainability in terms of the use of wood as a material, especially in construction. (Remember when plastic bags became popular because we were saving trees?) Wood is now back in popularity. There are 290 municipalities in Sweden and construction of multifamily dwellings in these municipalities increased by 29% in 2017. Ahola (2018) indicates that many of these municipalities currently have a wood building strategy. Consequently, it is inferred that a substantial portion of this new construction is wood based. The sustainability argument notes that industrial wood construction technology has the added advantages that

• Building hours in the workplace are shortened by 70%.
• The construction site is replaced by a mounting site.
• A dry and quality-assured factory environment is ensured.
• CO₂ emissions are reduced by 50% over a 50-year life cycle.

Then there is the matter of the involvement of a circular economical approach in the use of wood in construction. This consideration is the non-linear alternative to the usual extract-utilize-discard approach to usage of natural resources. Instead, it involves keeping resources in use as long as possible (thus housing as a key usage), extracting maximum value, including recovery and/or regenerating the resource. The (Swedish) government asserts that:

• Collaboration among participants in wood construction is important for industrial wood construction.
• There is a need for continued dissemination of knowledge to promote increased use of sustainable materials.
• Innovative architecture, innovation, development of new material combinations and technical solutions as well as digitization creates the conditions for continued development of industrial wood construction.
• There is still potential for increased exports in Swedish industrial wood construction, in terms of products, services and knowledge.

REFLECTIONS

How might a Swedish paper be relevant in the U.S.? In general, concern about the U.S. environment appears genuine. A recent column (Lowery, 2019) cited the following:

• According to a survey taken at Yale and George Mason University, 70 percent of respondents believed climate change is happening and 57 percent believe humans are causing it.
• A CNN poll suggested that 96 percent of Democrats supported taking an aggressive action to slow the effects of climate change.

Concern, however, has also been expressed with regard to the expense necessary to implement a sustainability program:

• An Associated Press/University of Chicago poll suggested that 57 percent of respondents were willing to pay approximately $1 per month to support an effort.

Even among the signatories of the Paris Agreement of 2015 there have been measured reactions when it came to supporting climate control:
• In France, gasoline and diesel hikes as part of a government plan to reduce carbon emissions, produced the yellow-vest movement and subsequent reversal of that program.

• In Australia’s national election (2019), although pre-election polling showed a majority of Australians supported climate change, election results supported the opposition.

This paper attempts to put present Swedish activities into some perspective, which led us to reflect upon the happenings in housing, the airline industry and the wood products sector. In each of these sectors, observations touched upon consumer involvement. There thus is the opportunity to see how practices are accepted in which there are consumer reactions can be followed. That is, sustainability improvements will involve costs to consumers. In MHC renovation, one can follow the reaction to higher rents. While rents cannot be raised without a significant reason in Sweden – they are collectively negotiated – it is still possible for landlords to use renovations as a basis for considerable increases. Swedish rents can only be raised if the renovation means increased living conditions; as a consequence, it has been suggested that landlords can use comprehensive renovations as a tactic to increase profits. Approval is needed for comprehensive renovations for sure and disputes are sometimes settled in court. In reality, landlords tend to win in nine cases out of ten. The situation of public and private tenants who cannot afford to pay high rents as a result of renovations is dramatic. During renovation, displacement of residents who no longer can afford to stay can occur. According to a newly published study from Gothenburg, a rent rise of 50 percent after renovations resulted in the displacement of at least 30 percent of tenants (Baeten, et al., 2016). Further, calculations by the National Board of Housing, Building and Planning, suggest displaced tenants tend to move to poorer areas, contributing to the deepening of segregation in Sweden (Swedish National Report). The term “renoviction” has been coined to describe the situation whereby tenants cannot afford to stay in apartments after renovation, but instead have to find another place to live.

Likewise, one will be able to monitor flying activities as associated with the tax increase. Naturally, there are some who support the tax and its implications; others, however, are taking a wait and see approach. Nevertheless, initial results are available. International flight growth has been cut in half (4%) compared to (9%) historically. At the same time, 188,000 fewer passengers in Sweden took domestic flights: a drop of three percent. Thus, results appear to be running ahead of the expected two percent reduction predicted by Swedish officials. Only the future will tell what the actual impact will be. Similarly, the wood impact is not so easy to follow. That effect is longer ranged and its impact on consumer spending is less clear. An early indication, however, will be the progression of municipalities who adopt a wood policy, particularly in multi-family dwellings.

In conclusion, we might reflect upon the degree to the observations made here might apply to the U.S. The approach in this paper basically followed Siggelkow’s (2007) definition of the use of cases as illustrations. That is, or should be, some natural curiosity of what a green new deal might be like and where it might lead us. Sweden is an acknowledged leader in sustainability and thus, it provides an illustration of what such a deal would be like and where it might be leading. The study, however, is narrow. We have confined ourselves to sustainability issues because our research has been almost exclusively within that area. Reflections on workers’ rights, education and health care in Sweden would be interesting, but are outside the coverage of this study.
Even in a broader sense caution is necessary in using these results. For one thing, Swedish interest in sustainability may be changing with respect to the priority that sustainability has in State policy. Perhaps the country is no longer as green as it has been, or perhaps people have more important priorities. The most recent national election was for EC representation in which Sweden has 20 representatives. Compared to the election in 2014, the Green Party dropped from more than 15 percent of the vote down to 11 percent, moving from second largest Swedish party in the EU-parliament, to the fourth biggest today. Previously, it had held four seats; it now has two. The Swedish Democrats, the immigrant concern advocate, had its best showing ever and gained a seat. There is also the concern that despite overall similarities, there are cultural differences between the two countries. For that, we turn to Hofstede (2019). His assessment is that there are major differences in the culture of the two countries – the differences in masculinity and long term orientation, in particular, suggest that sustainability should have a greater priority in Sweden than the U.S.

REFERENCES


Figure 1 – Sequential Nature of Swedish SD Development

- UN World Summit (Johannesburg) 2002
- Sustainable Development Definition (1987)
- Monitoring, e.g., Against EU Standards (2012)
- Implementation & Further Development
- Reg 2007a CEO Water
- Reg 2007b Jobs & Growth
- Reg 2010 Green Corridors
- Reg 2011 Environmental & Climate
- Reg 2013a Mineral Strategy
- Potential New Areas
Table 1 – List of items to be refurbished in renovation project (from Långström et al, 2019)

<table>
<thead>
<tr>
<th>Refurbishment item</th>
<th>13. new tap water system</th>
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<tbody>
<tr>
<td>1. asbestos sanitation in bathrooms and kitchens</td>
<td>14. 2 new laundry rooms</td>
</tr>
<tr>
<td>2. replacement of pipes</td>
<td>15. new fiber (broad band)</td>
</tr>
<tr>
<td>3. relining of wastewater pipes in the foundations</td>
<td>16. relining of existing water pipes</td>
</tr>
<tr>
<td>4. new shower rooms, furnishings and goods, new kitchens incl. preparation for dishwasher</td>
<td>17. new district heating culvert (added in a separate project)</td>
</tr>
<tr>
<td>5. new windows</td>
<td>18. new cold and hot water culvert (added in separate project)</td>
</tr>
<tr>
<td>6. new apartment doors</td>
<td>19. 2 heating stations (added in separate project)</td>
</tr>
<tr>
<td>7. new interior doors</td>
<td>20. replace old bicycle sheds</td>
</tr>
<tr>
<td>8. new electrical installation including residual-current devices (RCDs)</td>
<td>21. preparation for washing machines in 3 and 4 room apartments (no space available for washing machines in smaller flats)</td>
</tr>
<tr>
<td>9. new ventilation with new fan rooms</td>
<td>22. new mail boxes in stairwells,</td>
</tr>
<tr>
<td>10. refurbishment of 3 flat roofs to pitched roofs (3 have already been completed)</td>
<td>23. an additional flat.</td>
</tr>
<tr>
<td>11. renovate stairwells with painting and new lighting</td>
<td></td>
</tr>
<tr>
<td>12. new entries to the buildings</td>
<td></td>
</tr>
</tbody>
</table>