Proceedings of the Pennsylvania Economic Association

Annual Conference
May 28 – May 30, 2015

Penn State Berks
Reading, Pennsylvania
Proceedings of the
Pennsylvania Economic Association
2015 Annual Conference

May 28 – May 30, 2015
Penn State Berks
Reading, Pennsylvania

Kosin Isariyawongse, Editor
Edinboro University of Pennsylvania
Pennsylvania Economic Association
2014-2015

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Editor's Introduction and Acknowledgements

Kosin Isariyawongse, Ph.D.

Editor of Program and Proceedings

It is my privilege to present to you the Proceedings of the 2015 Pennsylvania Economic Association (PEA) Conference. It has been a real honor for me to serve as the Program Chair for this year’s conference. The papers published in this volume were presented in the 2015 PEA Conference held at Penn State Berks, May 28 – May 30, 2015. The program lists all presenters, session chairs, and discussants. The proceedings include only the papers that were presented at the conference and then later submitted for publication.

The 2015 PEA Conference brought together a tremendous and rich diversity of authors and speakers. University faculty, research professionals, government specialists, graduate students, and undergraduate students from across the country and around the world gathered in Reading, Pennsylvania to present their scholarly work to share ideas and receive constructive criticisms in a collegial environment. The 2015 PEA Conference proved to be a great success. Our conference owes its continued success to the efforts of the chairs, presenters, and discussants in all sessions. In addition, the PEA would like to thank the luncheon speaker, Mr. Thomas Hylton, and the Federal Reserve Bank of Philadelphia speakers, Mr. Paul Flora, Senior Economic Analyst and Research and Policy Support Manager, and Mr. Michael Trebing, Senior Economic Analyst.

The PEA would like to take this opportunity to thank Dr. Jui-Chi (Rocky) Huang for hosting this year’s conference in Penn State-Berks. His planning, energy, and hard work contributed to the success of this year’s conference. Thanks are also extended to Penn State-Berks, Federal Reserve Bank of Philadelphia, Dr. Hillkirk R. Keith, Chancellor, Penn State Berks, Dr. Paul Esqueda, Senior Associate Dean for Academic Affairs and Professor of Engineering, Penn State Berks, Dr. Janelle Larson, Division Head, Engineering, Business and Computing, and Associate Professor of Agricultural Economics, Penn State Berks, Cengage Learning, McGraw-Hill Education, Sapling Learning, and W.W. Norton for their support for this conference. In addition, The PEA would like to thank our board of directors and members of the executive board for their continued commitment to support our organization and conference.

The PEA would like to also take this opportunity to invite you to participate in the 2016 PEA conference, which will be held at Slippery Rocks University. We hope that you can be a part of this delightful event. See you in Slippery Rocks!
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Pennsylvania Economic Association

2015 CONFERENCE AGENDA

THURSDAY, May 28

04:00 pm – 09:00 pm Registration (1st Floor Lobby, Gaige*)
05:00 pm – 06:00 pm Board of Director’s Dinner (Gaige 246)
06:00 pm – 08:00 pm Board of Director’s Meeting (Gaige 244)
06:00 pm – 09:00 pm Reception (Gaige 247)
*Gaige Technology and Business Innovation Building

FRIDAY, May 29

08:00 am – 12:00 pm & 2:00 pm – 4:00 pm Registration (1st Floor Lobby, Gaige)
07:30 am – 10:30 am Cengage Breakfast (Gaige 248) – Continental Breakfast Sponsored by Cengage Learning
08:30 am – 09:00 am Cengage Demo (Gaige 248)
09:00 am – 10:15 am Concurrent Sessions (Gaige Classrooms 120, 121, 244, 245, 246, 247)
10:15 am – 10:30 am McGraw-Hill Coffee Break (2nd Floor Hallway, Gaige) – Coffee/Refreshment Sponsored by McCraw-Hill Education
10:30 am – 11:45 am Concurrent Sessions (Gaige Classrooms 120, 121, 244, 245, 246, 247)
12:00 pm – 12:45 pm Luncheon and 12:45 pm – 01:45 pm Speaker – Thomas Hylton “Save Our Land, Save Our Towns” (Multipurpose Room, Perkins Student Center)
02:15 pm – 03:30 pm Concurrent Sessions (Gaige Classrooms 120, 121, 244, 245, 246)
03:30 pm – 03:45 pm Break
03:45 pm – 04:45 pm Fed Lecture – Paul R. Flora and Michael E. Trebing (Multipurpose Room, Perkins Student Center)
05:00 pm – 08:00 pm Fed Sponsored Reception (Multipurpose Room, Perkins Student Center)

SATURDAY, May 30

07:30 am – 10:30 am Registration (1st Floor Lobby, Gaige)
07:30 am – 09:00 am Sapling Breakfast (2nd Floor Hallway, Gaige) – Coffee/Refreshment Sponsored by Sapling Learning
09:00 am – 10:15 am Concurrent Sessions (Gaige Classrooms 244, 245, 246, 247)
10:30 am – 11:00 am General Membership Meeting (Gaige 121)
11:00 am – 11:30 am McGraw-Hill Demo (Gaige 120) – Lunch Sponsored by McCraw-Hill Education
11:30 am – 12:00 pm Sapling Demo (Gaige 120) – Lunch Dessert (Ice Cream) Sponsored by Sapling Learning
12:00 pm Closing
Acknowledgement

Dr. Hillkirk R. Keith, Chancellor, Penn State Berks
Dr. Paul Esqueda, Senior Associate Dean for Academic Affairs and Professor of Engineering, Penn State Berks
Dr. Janelle Larson, Division Head, Engineering, Business and Computing, and Associate Professor of Agricultural Economics, Penn State Berks

Linda MacDuff, Assistant Director of Housing & Food Service/Catering and Cyber Cafe Director, Penn State Berks
Mark D. Dawson, Assistant Director of Operations, Penn State Berks
Paul Vicente, Supervisor of Environmental Services, Penn State Berks
Becky Eckenrode, Assistant Director of Admissions, Penn State Berks
Lisa Glass, Manager of Information Technology Services and Client Services Manager, Penn State Berks
Ron Garber, Instructional Services Manager, Penn State Berks
Phil Marshall, Campus Bookstore Manager, Penn State Berks
Kim Schreffler, Administrative Assistant of Development Office, Penn State Berks
Mitzi Brandon, Accountant Aide, Penn State Berks
Claudia Plato, Financial Assistant, Penn State Berks
Kathy Cavanaugh, Administrative Support Assistant of Continuing Education, Penn State Berks
Mary L. Fretz, Administrative Support Assistant of Police Services, Penn State Berks

Dr. Ali Alikhani-Koopaei, Associate Professor of Mathematics, Penn State Berks
Dr. Edwin Murillo, Assistant Professor of Spanish, Penn State Berks
Dr. Sudip Ghosh, Associate Professor of Business, Penn State Berks

Thomas Hylton, the Keynote Speaker, a Pulitzer Prize-winning journalist and the author of “Save Our Land, Save Our Towns”
Paul R. Flora, the Fed Lecture Panel Speaker, the Federal Reserve Bank of Philadelphia
Michael E. Trebing, the Fed Lecture Panel Speaker, the Federal Reserve Bank of Philadelphia

Cengage Learning
McGraw-Hill Education
Sapling Learning
W.W. Norton
FRIDAY, May 29, 2015
Conference Registration – 1st Floor Lobby, Gaige
8:00 AM – 12:00 PM
2:00 PM – 4:00 PM

Continental Breakfast – Gaige 248
7:30 AM – 10:30 AM

Session F1: Friday, May 29, 2015
9:00 AM – 10:15 AM

Session F1A: International Trade......................... Gaige 120 (9:00 – 10:15 am)
Chair: Frew Hailou, West Virginia State University

Factor Heterogeneity and International Trade
Frew Hailou, West Virginia State University

Ready Made Garments Trade of USA and Bangladesh
Abdul Pathan, Pennsylvania College of Technology

Balance of Trade: An Evolution of International Trade Theories
Justin Pendel, Youngstown State University

Investigating the Benefits of Currency Union on Trade: A Case Study for the WAMZ Countries
Tamsir Cham, Islamic Development Bank

Discussants:
Michael Morrison, Edinboro University of Pennsylvania
Frew Hailou, West Virginia State University
Tamsir Cham, Islamic Development Bank
Abdul Pathan, Pennsylvania College of Technology
**Session F1B: Labor Economics ............................... Gaige 121 (9:00 – 10:15 am)**
Chair: **Sandra Trejos**, Clarion University of Pennsylvania

Child Labor and Economic Growth in Latin America
**Sandra Trejos**, Clarion University of Pennsylvania

**Farhad Saboori**, Albright College

Social Exclusion, Labor Force Participation and Urban Poverty: A Case Study Marginalized Community of Lahore, Pakistan
**Kanwal Zahra**, University of Central Punjab, Lahore, Pakistan
**Tasneem Zafar**, GC University, Lahore
**Aitzaz Khursheed**, University of Central Punjab, Lahore

**Discussants:**
**Farhad Saboori**, Albright College
**David Doorn**, West Chester University of Pennsylvania
**Sandra Trejos**, Clarion University of Pennsylvania

**Session F1C: Taxation and Zoning ............................... Gaige 244 (9:00 – 10:15 am)**
Chair: **Kosin Isariyawongse**, Edinboro University of Pennsylvania

A Multi-County Study on the Impacts of Earned Income Tax Credit in Pennsylvania
**Kosin Isariyawongse**, Edinboro University of Pennsylvania
**Shuang Feng**, Edinboro University of Pennsylvania
**Lei Zhang**, North Dakota State University

The Anatomy of Tax-Inversion
**Sudip Ghosh**, Penn State Berks
**Ujjal Chatterjee**, American University of Sharjah

City Revitalization and Improvement Zones: Pennsylvania’s Enterprise Zone Initiative
**Thomas Armstrong**
**Dan Meuser**

**Discussants:**
**Thomas Armstrong**
**Ruttana Ruttanajarounsab**, Edinboro University of Pennsylvania
**Sudip Ghosh**, Penn State Berks
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Chair: Michael Malcolm, West Chester University

Influencing Factors on the Choice of Undergraduate Business Major and the Role of Gender
Victoria Geyfman, Bloomsburg University
Laura Davis, Bloomsburg University
Christina Force, Bloomsburg University

Female Empowerment and its Implications for Women’s Health Care Utilization in India
Divya Balasubramaniam, Saint Joseph’s University

What Can We Make of Unsubstantiated Child Abuse Reports? A New Approach
Michael Malcolm, West Chester University

Discussants:
Divya Balasubramaniam, Saint Joseph’s University
Michael Malcolm, West Chester University
Victoria Geyfman, Bloomsburg University

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Chair: Steven Breslawski, College at Brockport, State University of New York

The Impact of Student Learning Style on Economics Assessment Outcomes
Steven Breslawski, College at Brockport, State University of New York

A Comparison of Student Learning Outcomes in Online versus Traditional Class Settings
Sunita Mondal, Slippery Rock University
Dave Culp, Slippery Rock University

Two Technologies in Principles of Economics: Sapling vs. Aplia
Carlos Liard-Muriente, Central Connecticut State University
Nara Mijid, Central Connecticut State University

Does Aplia’s “Grade It Now” Option Improve Student Learning?
Veronika Dolar, Long Island University

Discussants:
Carlos Liard-Muriente, Central Connecticut State University
Veronika Dolar, Long Island University
Sunita Mondal, Slippery Rock University
Steven Breslawski, College at Brockport, State University of New York
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Chair: Stephanie Brewer, Indiana University of Pennsylvania

The Health and Economic Burden of Tuberculosis: An Analysis of BCG Vaccine Global Supply and Demand
Katherine Theiss, Connecticut College

Correlation between Drug Related Homicide and Drug War
Mahamadou Djigue, Edinboro University of Pennsylvania

Universal Healthcare and Welfare Benefits Effects on Labor Productivity in Developed Comparative Nations
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Timothy Holman, Clarion University of Pennsylvania

Gender Differences in Housework and Wages
Chi Zhang, Swarthmore College

Discussants:
Stephanie Brewer, Indiana University of Pennsylvania
Xiaochun Liu, University of Central Arkansas
Shuang Feng, Edinboro University of Pennsylvania
Inoussa Boubacar, Clarion University of Pennsylvania
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Chair: Abdulaziz Shifa, Syracuse University

Economic Growth and Trade in Human Capital  
Abdulaziz Shifa, Syracuse University

The Institution Necessary for Growth  
Woubet Kassa, American University

Spatial Spillover Effects of Debt Relief from the Heavily Indebted Poor Countries (HIPC) Initiative  
Minh Tam Schlosky, Sewanee: The University of the South

Discussants:  
Minh Tam Schlosky, Sewanee: The University of the South  
Abdulaziz Shifa, Syracuse University  
Woubet Kassa, American University

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Chair: Brian Sloboda, US Department of Labor

A Dynamic Shift-Share Analysis of Employment Change in Pennsylvania  
David Doorn, West Chester University of Pennsylvania  
Kyle Kelly, Skidmore College

The Changes in Workforce Patterns on a County Level in the Commonwealth of Pennsylvania 2002-2011  
Brian Sloboda, US Department of Labor  
Yaya Sissoko, Indiana University of Pennsylvania

Discussants:  
Brian Sloboda, US Department of Labor  
David Doorn, West Chester University of Pennsylvania
**Session F2C: International Economics I .......... Gaige 244 (10:30 – 11:45 am)**

Chair: **Yaya Sissoko**, Indiana University of Pennsylvania

Trade Openness, FDI and Economic Growth: Empirical Causality Evidence from Singapore and Malaysia  
**Yaya Sissoko**, Indiana University of Pennsylvania

Trade Networks with Even Network Structures under Asymmetric Information  
**Sabri Yilmaz**, Penn State Harrisburg

Russia vs. the West: The Economic Battle for Ukraine  
**Randall Newnham**, Penn State Berks

Geographical Agglomeration of Large Scale Manufacturing Industries in Punjab province of Pakistan  
**Asim Iqbal**, University of Central Punjab

**Discussants:**  
**Sabri Yilmaz**, Penn State Harrisburg  
**Sandra Trejos**, Clarion University of Pennsylvania  
**Yaya Sissoko**, Indiana University of Pennsylvania  
**Xuebing Yang**, Penn State Altoona

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Chair: **Steven Andelin**, Penn State Schuylkill

Estimating the Effects of Time in Extracurriculars and Paid Work on Study Time and Class Time for Live-at-Home College Students  
**Laura Crispin**, Saint Joseph’s University

Taming Statistics for Business Students  
**Stephen Mansour**, University of Scranton

Are the Teaching Models of Macroeconomics Good Enough?  
**Steven Andelin**, Penn State Schuylkill

The Influence of Motivational Factors on Business Professors’ Inclinations to Retire  
**David Nugent**, California University of Pennsylvania

**Discussants:**  
**Steven Andelin**, Penn State Schuylkill  
**David Nugent**, California University of Pennsylvania  
**Stephen Mansour**, University of Scranton  
**Laura Crispin**, Saint Joseph’s University
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Woosoon Kim, Alvernia University  
Tufan Tiglioglue, Alvernia University

Food and Medical Engel Curve Using a Quantile Approach  
Elsy Thomas, BGSU Firelands

The Initial Stage of Sport Index (SI) Development  
Woosoon Kim, Alvernia University  
Hong Rim, Shippensburg University  
Won Yong Kim, Dickinson College

Discussants:  
Elsy Thomas, BGSU Firelands  
Michael Malcolm, West Chester University  
Sunita Mondal, Slippery Rock University

Session F2F: Undergraduate Student Paper Session II … Gaige 247 (10:30 – 11:45 am)  
Chair: Abdul Pathan, Pennsylvania College of Technology

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Jessica Black, Indiana University of Pennsylvania  
Savanna Bonds, Indiana University of Pennsylvania

A Comparative Analysis of Rwanda, Japan, and the United Kingdom’s Education Systems  
Stephanie Lightner, Clarion University of Pennsylvania  
Matthew Vano, Clarion University of Pennsylvania  
Joseph Buzard, Clarion University of Pennsylvania

Value Judgments of Introductory Economics Instructors and Teaching of the Minimum Wage  
Johan Rundquist, Long Island University

A study of Youngstown Public Housing Program Participants’ preferences  
Ashley Orr, Youngstown State University

Discussants:  
Abdul Pathan, Pennsylvania College of Technology  
Farhad Saboori, Albright College  
Victoria Geyzman, Bloomsburg University  
Veronika Dolar, Long Island University
Keynote Speaker Luncheon
Friday, May 29, 2015
12:00 PM – 1:45 PM
Multipurpose Room, Perkins Student Center
Keynote Speaker
Friday, May 29, 2015
12:00 PM – 1:45 PM
Multipurpose Room, Perkins Student Center

“Save Our Land, Save Our Towns”

Thomas Hylton

Thomas Hylton, a Pulitzer Prize-winning journalist, is author of a color coffee table book called Save Our Land, Save Our Towns. The book is a plea for comprehensive planning to save our cities, towns, and countryside. Hylton is also host of an hour-long public television documentary called Save Our Land, Save Our Towns. The program has been broadcast prime time on all Pennsylvania PBS stations and has aired on more than 100 PBS stations nationwide.

As president of Save Our Land, Save Our Towns Inc., a non-profit corporation, Hylton serves as an advocate of traditional towns that house people of all ages, races, and incomes. Since publication of the book, Hylton has given 450 presentations in Pennsylvania and 34 other states on land use planning and community building. He has addressed the nation’s governors at the annual conference of the National Governors’ Association in Washington. He has given talks to legislators sponsored by both the Democratic and Republican caucuses of the Pennsylvania House and Senate.
Hylton is an organizing member of 10,000 Friends of Pennsylvania, a coalition of civic groups dedicated to land use reforms and community building in Pennsylvania. A three-time winner of the American Planning Association’s annual journalism award, Hylton received a fellowship from the Society of Professional Journalists in 1993 to study state planning issues. A native of Wyomissing, Pennsylvania, Hylton has lived all his life in Pennsylvania cities and towns. Since 1973, Hylton has lived in Pottstown with his wife, Frances, who retired in 2008 after teaching in Pottstown elementary schools for 35 years. For 22 years, Hylton wrote for Pottstown’s daily newspaper, The Mercury. His editorials advocating the preservation of farmland and open space in southeastern Pennsylvania won a Pulitzer Prize in 1990.

Hylton conceived and organized Trees Inc., a non-profit corporation that raised nearly $500,000 to plant and maintain street trees in Pottstown. He co-founded Preservation Pottstown, an organization dedicated to preserving Pottstown’s historic neighborhoods and enhancing the borough’s quality of life. He helped bring about the integration of Pottstown’s elementary schools through a special edition of The Mercury advocating the cause. Hylton is a member of the Pottstown School Board. He previously served 12 years as chairman of the Pottstown Planning Commission and 15 years as chairman of the Pottstown Shade Tree Commission. In 2003, Pottstown Council adopted an innovative “user-friendly” zoning ordinance Hylton wrote with a grant from the William Penn Foundation.

Hylton provides his services to Save Our Land, Save Our Towns pro bono.
Session F3: Friday, May 29, 2015
2:15 PM – 3:30 PM

Session F3A: Monetary Economics ................. Gaige 120 (2:15 – 3:30 pm)
Chair: John Walker, Kutztown University

Does Your Community Bank’s Dividend Policy Make Sense?
John Walker, Kutztown University
Jonathan K. Kramer, Kutztown University
Robert Pachence, Financial Group

Determinants of Bank Credit Ratings during the 2007-2010 Credit Crisis
John Ruddy, University of Scranton

Endogenous Money, Bank Capital and Bank Profits
Paul Orzechowski, CUNY - College of Staten Island

Systemic Risk of Large U.S. Bank Holding Companies with Regime Switching in Tails
Xiaochun Liu, University of Central Arkansas

Discussants:
Xiaochun Liu, University of Central Arkansas
John Walker, Kutztown University
John Ruddy, University of Scranton
Elsy Thomas, BGSU Firelands
Session F3B: International Economics II ..................... Gaige 121 (2:15 – 3:30 pm)
Chair: Orhan Kara, West Chester University

Small Business Entrepreneurs: Chinese Case
Orhan Kara, West Chester University
Kubilay Gok, Abdullah Gul University
Hung Chu, West Chester University

Markups and Export Status of Chinese Firms
Xuebing Yang, Penn State Altoona

Empirics of Vertical Specialization in East Asian Economies: China, Japan, and South Korea
Sang-Yong Oh, Bloomsburg University

Explaining the Flows of Foreign Portfolio Investments to Emerging Markets: The Case of South Africa.
Inoussa Boubacar, Clarion University of Pennsylvania
Yaya Sissoko, Indiana University of Pennsylvania

Discussants:
Xuebing Yang, Penn State Altoona
Sang-Yong Oh, Bloomsburg University
Inoussa Boubacar, Clarion University of Pennsylvania
Sabri Yilmaz, Penn State Harrisburg

Session F3C: Economics of Education II ..................... Gaige 244 (2:15 – 3:30 pm)
Chair: Mark Eschenfelder, Robert Morris University

Explaining the High School Dropout Rate: A Panel Data Analysis of Pennsylvania Counties
Stephanie Brewer, Indiana University of Pennsylvania
Jessica Black, Indiana University of Pennsylvania

Assurance of Learning: What Do Economics Faculty at Community Colleges Know and What Do They Believe?
Mark Eschenfelder, Robert Morris University
Lois Bryan, Robert Morris University
Tanya Lee, Valdosta State University

Discussants:
Mark Eschenfelder, Robert Morris University
Stephanie Brewer, Indiana University of Pennsylvania
**Session F3D: General Economics II ........................................ Gaige 245 (2:15 – 3:30 pm)**  
Chair: **Shuang Feng**, Edinboro University of Pennsylvania

Economic Impacts of Energy Development: Opportunities, Challenges and Policy Implications  
**Tahereh Alavi Hojjat**, DeSales University

Competitive Facility Location Problem on Networks  
**Abdullah Konak**, Penn State Berks  
**Sadan Kulturel-Konak**, Penn State Berks

A Third Look at Public Housing in Sweden: The Influence of Owner Directives  
**Timothy Wilson**, Umeå School of Business and Economics  
**Lars Lindbergh**, Umeå School of Business and Economics

**Discussants:**  
**Timothy Wilson**, Umeå School of Business and Economics  
**Tahereh Alavi Hojjat**, DeSales University  
**Abdullah Konak**, Penn State Berks

**Session F3E: Special Session ............................................... Gaige 246 (2:15 – 3:30 pm)**  
Chair: **Tracy Miller**, Grove City College

Problems with Piketty: The Flaws and Fallacies in Capital in the Twenty-First Century  
**Mark Hendrickson**, Grove City College

The Federal Reserve, Crony Capitalism and the Growth of Inequality  
**Tracy Miller**, Grove City College
Paul R. Flora is a manager in the regional section of the Research Department of the Federal Reserve Bank of Philadelphia. His responsibilities include coordinating the regional economic analysis of the Third Federal Reserve District and preparing the Beige Book, a report of anecdotal information on current economic conditions published eight times a year. His
research interests include regional economics, public finance, and state and local fiscal analysis.

Before joining the Philadelphia Fed in 2009, Flora was a fiscal analyst and principal planner for Hillsborough County City-County Planning Commission in Florida. During his tenure, he developed fiscal impact estimates of land development (FIELD) model, which tested the financial feasibility of comprehensive plans for Hillsborough County and Tampa, Temple Terrace, and Plant City. He also worked as an urban/regional planner in Illinois, Pennsylvania, and Virginia. In addition, he was the regional economist at PNC Bank Corp, an associate editor on the editorial board of the Pittsburgh Post-Gazette, and an adjunct professor of regional economics and urban studies at the University of Pittsburgh. He taught three courses covering city history, urban policy, and regional economic analysis for Semester at Sea, a shipboard education program that took him around the world and gave him the opportunity to visit 10 ports.

He is a member of the National Association for Business Economics, the American Planning Association, and the American Institute of Certified Planners. He currently serves on the board of Tempesta di Mare, a Philadelphia baroque orchestra. He also served as founding board member, chairperson, and treasurer of the North Point Breeze Planning and Development Corporation in Pittsburgh.

Flora holds a bachelor’s degree in economics from the College of William & Mary, a master’s degree in urban and regional planning from Virginia Polytechnic Institute and State University, and a master’s degree in economics from the University of Pittsburgh.
Michael E. Trebing is a senior economic analyst at the Federal Reserve Bank of Philadelphia, specializing in analysis of the region. He is the administrator of several regional surveys, including the Manufacturing Business Outlook Survey, which is often used to gauge the strength of the U.S. manufacturing industry.

Prior to his work at the Bank, Trebing held several management positions in the Federal Reserve Bank of St. Louis’s Check, ACH, IT, Statistics, and Research Divisions. Before that, he was an economist in the St. Louis Fed’s Research Department. He was also an economics instructor at the University of Mississippi, St. Louis University, and Southern Illinois University. His other positions include work as a financial futures analyst with Clayton Brokerage, St. Louis, and a research associate with the Bureau of Economic and Business Research at the University of Illinois.

Trebing has a bachelor’s degree in mathematics and economics from Southern Illinois University and a master’s degree in economics from the University of Illinois.
Fed Sponsored Reception
Friday, May 29, 2015
5:00 PM – 8:00 PM
Multipurpose Room, Perkins Student Center
SATURDAY, May 30, 2015
Conference Registration – 1st Floor Lobby, Gaige
7:30 AM – 10:30 AM

Continental Breakfast – 2nd Floor Hallway, Gaige
7:30 AM – 9:00 AM

Session S1: Saturday, May 30, 2015
9:00 AM – 10:15 AM

**Session S1A: Economics and Incentives** .......................... Gaige 244 (9:00 – 10:15 am)
Chair: Gayle DeLong, Baruch College

CEO/President Forced Resignations: Types and Impact on Corporate Performance
**Khaled Abdou**, Penn State Berks
**Oscar Varela**, University of Texas at El Paso

Why Do People Keep Their Promises? A Further Investigation
**Steven Schwartz**, Binghamton University
**Eric Spires**, the Ohio State University
**Richard Young**, the Ohio State University

Is “Delitigation” Associated with a Change in Product Safety? The Case of Vaccines
**Gayle DeLong**, Baruch College

**Discussants:**
**Gayle DeLong**, Baruch College
**Kosin Isariyawongse**, Edinboro University of Pennsylvania
**Steven Schwartz**, Binghamton University
**Session S1B: Public Finance** ........................................ Gaige 245 (9:00 – 10:15 am)

Chair: Mehdi Hojjat, Neumann University

Projection of the U.S. Balance of Payments
Mehdi Hojjat, Neumann University

The Fiscal Multiplier and the Fiscal Limit
John Francois, University of Kansas

Bilal Muhammad Yaseen, University of Central Punjab, Lahore, Pakistan

**Discussants:**
John Francois, University of Kansas
John Walker, Kutztown University
Sudip Ghosh, Penn State Berks

**Session S1C: General Economics III** ............................... Gaige 246 (9:00 – 10:15 am)
Chair: I-Ming Chiu, Rutgers University/Camden

Application of Finite Mixtures to the Study of Investment under Financial Constraints
Judex Hyppolite, Monmouth University

The Dynamics of Immigration, Culture, and Morality
I-Ming Chiu, Rutgers University/Camden
Daneil Hart
Michael Sulik

Common-Pool Resource Theory
Christina Saelzer, Youngstown State University

The Economics of “The Hunger Games”
Jeffrey Cleveland, Howard Community College

**Discussants:**
I-Ming Chiu, Rutgers University/Camden
Christina Saelzer, Youngstown State University
Jeffrey Cleveland, Howard Community College
Judex Hyppolite, Monmouth University
**Session S1D:** Student Paper Session III ........................ Gaige 247 (9:00 – 10:15 am)
Chair: James Jozefowicz, Indiana University of Pennsylvania

Economic Growth and Unemployment Linked to Income Inequality
**Stephanie Lightner,** Clarion University of Pennsylvania

The Cost of Minimum Wage
**Peter Yu,** Edinboro University of Pennsylvania

21st Century Business Students: The Need to Develop Global Awareness
**Kelly Yoder,** Penn State Berks
**Sadan Kulturel-Konak,** Penn State Berks
**Abdullah Konak,** Penn State Berks

Scores of Professional Golfers Based Off of Skill Sets
**Conor Gilbert,** Millersville University
**Collan Wetzel,** Millersville University

**Discussants:**
**James Jozefowicz,** Indiana University of Pennsylvania
**Sandra Trejos,** Clarion University of Pennsylvania
**Tracy Miller,** Grove City College
**Steven Breslawski,** College at Brockport, State University of New York
General Membership Meeting
Saturday, May 30, 2015
10:30 AM – 11:00 AM
Gaige 121

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.

Door Prizes will be Awarded

McGraw-Hill Demo
Lunch Sponsored by McGraw-Hill Education
Saturday, May 30, 2015
11 AM – 11:30 AM
Gaige 120

Sapling Demo
Lunch Dessert (Ice Cream) by Sapling Learning
Saturday, May 30, 2015
11:30 AM – 12 PM
Gaige 120

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City Revitalization and Improvement Zones: Pennsylvania’s Enterprise Zone Initiative

Thomas O. Armstrong*
Dellicker Strategies
Mechanicsburg, PA 17050

Dan Meuser*
Shavertown, PA 18708

ABSTRACT

Enterprise zones are intended to stimulate economic activity in economically distressed geographical areas. Pennsylvania created enterprise zones called City Revitalization and Improvement Zone (CRIZ). A CRIZ is an area of up to 130 acres, comprised of parcels designated by a local contracting authority, to provide economic development and job creation. State and local taxes collected within the CRIZ will be used to repay debt service and economic development improvements projects within the CRIZ. Two zones were designated in 2013 and two additional zones may be designated in 2016 and each year afterward in certain Pennsylvania third class cities.

I. INTRODUCTION

Market failures exist where resources are not being used in an efficient growth-promoting means leading to under-performing economic areas. There are many possible market failures that adversely affect business in general and small businesses in particular. Market failures include inadequate level of job training skills, poor information on management and technology, impediments to commercialization of technology, insufficient entrepreneurial support, difficulty in exporting, and problems in obtaining financing (Bartik, July 1, 1996). The market failures in particular geographical areas assume a high costs as a key barrier, preventing increases in economic activity. The result is an inadequate private return on investment; thus, inadequate economic performance. Hirasuna and Michael (January 2005) provide possible reasons for the economic barriers:

- “Transportation problems: The area may have poor access to roads, rail, and other means to transport goods and services.
- Access to capital: Bankers may be reluctant to loan money to businesses or individuals in the area. Some areas may have a wide pool of potential investors, while others do not.
- Available labor: There may be only a few workers with the skills an entrepreneur needs to set up a successful operation.
- Social problems: The neighborhood may have high crime rates creating concerns about property damage, theft, or personal harm.
- Environmental problems: Available sites may require incurring costly environmental cleanup expenses.”

State and local governments have developed many different forms of tax and non-tax incentives to overcome market failures resulting in economic barriers or higher costs of zone locations to increase substandard economic performance. Tax incentives reduce tax liability for economic or location activities. An example is a sales and use tax manufacturing exemption to lower sales tax liability for manufacturing business input purchases within a state. Non-tax incentives can be in the form of state financial assistance to reduce costs, such as construction loans, equipment loans or bond financing (Gilbert, 1995).

While the evidence is mixed, the general conclusion is that limited tax incentives alone may not reverse these market failures and lead to economic growth. However, an active economic development strategy involving a mixture of non-tax and tax incentives can improve the likelihood of increased economic growth (Fisher and Peters, March/April 1997).

This paper will discuss enterprise zones and incentive impacts. Afterwards, Pennsylvania’s newly created enterprise zones: City Revitalization and Improvement Zone (CRIZ) program is described. By the use of targeted financial resources from state and local tax revenues attributed to the CRIZ, greater economic development and performance is expected for these zones. Lastly concluding comments are provided.
II. ENTERPRISE ZONES

Enterprise zones are geographically targeted areas providing tax and non-tax incentive programs designed to enhance economic growth. Within the literature, there is some evidence to suggest that enterprise zones with a mixture of tax and non-tax incentives can be moderately positive in terms of economic growth potential (Kee, et. al., October 30, 1995). While Hirasuna and Michael (January 2005) report that studies using regression analysis have produced mixed estimates of benefits of state enterprise zones.

Elling and Sheldon (1991) examined enterprise zones in Illinois, Indiana, Kentucky and Ohio. The authors concluded most of the zones were moderately successful. Their study suggested that tax policy alone will not lead to economic development. Administrative resources and, to a lesser extent, technical assistance are important for effective zone development.

Moore (2003) found a positive increase in the number of finance, insurance, and real estate establishments and wholesale and retail trade establishments. The number of manufacturing establishments was negative, but not statistically significantly related to the creation of a zone.

O'Keefe’s (2004) study indicate temporary increases in employment with these gains turning negative sometime between seven and 13 years. She found no positive effect upon earnings.

Armstrong (Fall 2010) reports that the Keystone Innovation Grant program to encourage technology transfer as a companion program to the Pennsylvania Keystone Innovation Zone program (Armstrong and Yazdi, 2004) leveraged private to public dollars by about 11 to 1 suggesting the enhancement of additional economic activity within the Zone program.

Out of 1,623 zone establishments that made new investments in the zones, 26.4 percent were new firms and 57 percent were existing zone firms that had expanded (54.8 percent) or that changed plans to contract (2.2 percent). Only 7.5 percent were new branch plants of non-zone firms, and 9.1 percent were relocations of existing establishments from outside the zone, although these establishments tended to produce larger employment gains per establishment.

Of course, the ratio of new to existing firms will be different for Pennsylvania’s zones, but the study may suggest that the majority of zone investments will come from existing firms within a designated zone. Zone management should foster this type of investment while attempting to attract new firms.

In addition to the type of firms making zone investments, Barry Rubin (Spring 1996) offers five factors for successful zones:

1. the economy of the area encompassed by the zone must still be economically viable;
2. the zone should include a mixture of land uses, ideally containing significant amounts of commercial and industrial activities, and a sizable residential population;
3. the zone should be actively managed;
4. the zone organization should be an independent and autonomous agent; and
5. there should be strong support for the zone and its activities from both the public and private sectors.

What tentative conclusions can be drawn from this brief survey for Pennsylvania? Enterprise zones have a greater likelihood of success when financial incentives, tax accompanied by non-tax incentives, should include active development and administrative and marketing strategies. Furthermore, a significant portion of private investment will tend to come from firms already within the designated zones. Pennsylvania’s new created City Revitalization and Improvement Zone program incorporates additional revenue for zone development with factors offered by Rubin.

III. CITY REVITALIZATION AND IMPROVEMENT ZONES ESTABLISHMENT

The City Revitalization and Improvement Zone
The program (CRIZ) was established by Act 52 of 2013. The program is designed to allow a contracting authority to designate a City Revitalization and Improvement Zone for the purpose of improvement and development within a third class city with a population of at least 30,000 based on the most recent Federal census. Table 1 provides a list of ten Pennsylvania 3rd class cities with a population of at least 30,000 from the 2010 census that may apply for a CRIZ.

### Table 1: Pennsylvania 3rd Class Cities with a Population of at Least 30,000

<table>
<thead>
<tr>
<th>City</th>
<th>County</th>
<th>2010 Census</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allentown</td>
<td>Lehigh</td>
<td>118,032</td>
</tr>
<tr>
<td>Erie</td>
<td>Erie</td>
<td>101,786</td>
</tr>
<tr>
<td>Reading</td>
<td>Berks</td>
<td>88,082</td>
</tr>
<tr>
<td>Bethlehem</td>
<td>Lehigh and Northampton</td>
<td>74,982</td>
</tr>
<tr>
<td>Lancaster</td>
<td>Lancaster</td>
<td>59,322</td>
</tr>
<tr>
<td>Harrisburg</td>
<td>Dauphin</td>
<td>49,528</td>
</tr>
<tr>
<td>Altoona</td>
<td>Blair</td>
<td>46,320</td>
</tr>
<tr>
<td>York</td>
<td>York</td>
<td>43,718</td>
</tr>
<tr>
<td>Wilkes-Barre</td>
<td>Luzerne</td>
<td>41,498</td>
</tr>
<tr>
<td>Chester</td>
<td>Delaware</td>
<td>33,972</td>
</tr>
</tbody>
</table>

Act 52 provides for restrictions on Pennsylvania 3rd class cities eligible to participate within the CRIZ program. First, Act 47 distressed cities that are in receivership may not apply for the program. Second, Act 47 distressed cities located in a “home rule” county may not establish a contracting authority unless the county authorizes the distressed city to designate a zone.

Under Act 47, Altoona, Reading, Harrisburg and Chester are distressed cities that would qualify for the program under the population parameter. Blair county and Berks county are not under “home rule” charters, therefore Altoona and Reading do not have any restrictions preventing the establishment of an authority. Delaware County is under a “home rule” charter therefore the city of Chester, to establish a zone, would need authorization from the county.

From the statute, the City of Harrisburg has had a receiver appointed Chapter 7 of the Municipalities Financial Recovery Act; therefore, would not qualify under the CRIZ program.

The creation of a contracting authority must be created prior to submission of a CRIZ application for approval. A contracting authority may designate up to 130 acres as a zone(s) within a qualified city. The powers of the contracting authority include designating zones. The contracting authority may designate a zone where a structure or complex of structures to be used for commercial, sports, exhibition, hospitality, conference, retail, community, office, recreational or mixed-use purposes may be constructed, reconstructed or renovated. Construction includes related infrastructure and site preparation.
Zones may not overlap locations with economic development incentive such as the Keystone Opportunity Zone, Keystone Opportunity Improvement Zone, Keystone Expansion Zone, Keystone Special Development Zone, Strategic Development Area, Keystone Innovation Zone, or Neighborhood Improvement Zone programs.

Two zones were designated in 2013 and two additional zones may be designated in 2016 and each year afterward. Designation requires approval of an application by: the Department of Community and Economic Development, Department of Revenue and the Office of the Budget. On December 30, 2013, the cities of Bethlehem and Lancaster received approval for a CRIZ designation.

In addition to the CRIZ, Act 52 of 2013 and amended by Act 194 of 2014 provided for pilot zone. A pilot zone is similar to CRIZ; however, a contracting authority created within a city, home rule county, township or borough may designate up to 130 acres as a zone within a township or borough with a population of at least 7,000 based on the most recent Federal census. Only one zone may be designated within this program. Similar to a CRIZ, designation requires approval of an application by: the Department of Community and Economic Development, Department of Revenue and the Office of the Budget. Zones may not overlap locations with economic development incentive programs exactly the same as for a CRIZ. On December 31, 2014, the Borough of Tamaqua, Schuylkill County received approval for a Pilot Zone designation.

A CRIZ and Pilot Zone serves as the official boundaries to identify businesses or business activity within the designated area. Acres may be added or removed after the designation of a zone; if the acres were not targeted with CRIZ funds for development. Approval is required by the Department of Community and Economic Development in consultation with the Office of the Budget and the Department of Revenue. The activity will be measured by state and local taxes collected by the Commonwealth or local taxing authority within a Zone. Eligible state and local taxes will be transferred from the general fund or local government fund to the State Treasurer for deposit into the CRIZ fund(s).

IV. CITY REVITALIZATION AND IMPROVEMENT ZONES FUNDING

The funding for the CRIZ program is structured to protect the Commonwealth tax base, while providing funding for tax revenues based on new growth generated over and above an established state tax baseline. The discussion of the CRIZ program includes both the CRIZ and Pilot Zones together. The expectation is that new long term revenues will generate new long term economic development investment.

The award year of the CRIZ program establishes the initial year to calculate the baseline tax basis for the program. A baseline is established by the Department of Revenue, through the collection of CRIZ state tax reports by businesses within the zone. The baseline will effectively retain all state tax dollars with the Commonwealth, but will allow local tax dollars to flow back to the Authority from the State Treasurer.

Each year after the award year to the sunset of CRIZ program, incremental gains to state taxes exceeding the basis will be transferred to the CRIZ Fund. The tax basis set in program year 1 (baseline) will be retained by the state on an annual basis. All local taxes will be transferred to the CRIZ fund. A CRIZ Zone will sunset for the period equal to the payment of all debt service incurred, including bond repayment or 30 years, whichever occurs first.

It should be noted that the baseline figure established in year one may be adjusted due to relocation provisions. Businesses locating from a non-CRIZ within Pennsylvania relocating into a CRIZ will be required to file a state tax CRIZ report. The tax revenue from the relocating business will be added to the baseline. However, businesses moving into the zone from outside of Pennsylvania will be utilized by the CRIZ fund directly without affecting the baseline.

The eligible state and local taxes to be included in the calculated baseline and increment are listed in Table 2.
Table 2: Eligible CRIZ Taxes

<table>
<thead>
<tr>
<th>State Taxes</th>
<th>Local Taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank Shares Tax</td>
<td>Amusement Tax</td>
</tr>
<tr>
<td>Corporate Net Income Tax</td>
<td>Business Privilege Tax</td>
</tr>
<tr>
<td>Capital Stock and Franchise Tax</td>
<td>Earned Income Tax</td>
</tr>
<tr>
<td>Personal Income Tax</td>
<td>Local Services Tax</td>
</tr>
<tr>
<td>Sales and Use Tax</td>
<td></td>
</tr>
<tr>
<td>Tax paid to the Commonwealth on the sale</td>
<td></td>
</tr>
<tr>
<td>of liquor, wine, malt or brewed beverage in the</td>
<td></td>
</tr>
<tr>
<td>zone</td>
<td></td>
</tr>
</tbody>
</table>

The contracting authority must submit to the Department of Revenue a list of all qualified businesses in the CRIZ by June 1 of each year. All qualified businesses and construction contractors located within the zone, must file a State CRIZ tax report and Local CRIZ tax report by June 15 on an annual basis to identify taxes attributable to the zone. The Department of Revenue will verify and certify to the Office of the Budget the state taxes attributable to the CRIZ, less the baseline, by October 15 each year. Local taxes attributable to the CRIZ will be certified and transferred directly by the local taxing entity to the Pennsylvania Treasurer by October 15 of each year.5

The Office of the Budget will direct the Pennsylvania Treasurer to transfer the certified amount of state taxes from the General Fund to the CRIZ Fund for each zone by October 25 of each year. The Pennsylvania Treasurer will authorize payment of certified state and local taxes from the CRIZ Fund to the contracting authority by November 4 of each year.

The powers of the contracting authority include uses of CRIZ funds by providing or borrowing money for the development or improvement within a zone and construction, including related site preparation and infrastructure, reconstruction or renovation of a facility within a zone that will result in economic development according to the state-approved zone plan. More specifically, CRIZ funds can be used for the following:6

1. Payment of debt service on bonds issued for the construction, including related infrastructure and site preparation, reconstruction or renovation of a facility in the zone.
2. Construction, including related infrastructure and site preparation, reconstruction or renovation of all or a part of a facility.
3. Replenishment of amounts in debt service reserve funds established to pay debt service on bonds.
4. Employment of an independent auditing firm to perform duties on behalf of Authority as regulated by the legislation.
5. Improvement or development of all or part of a zone.
6. Improvement projects including fixtures and equipment for a facility owned by a public authority.

In the event the fund transfer is insufficient to cover bond financing, the statute permits the contracting authority to apply to the Department of Community and Economic Development, Department of Revenue and Office of the Budget for additional funding from the baseline. If approved by the three agencies, the amount of funds that can be transferred is limited to 50% of the State tax baseline, not to exceed $10,000,000 in the calendar year. The transfer is restricted to the first seven years of the program.

Money transferred must be repaid to the General Fund by the contracting authority by the date of final payment of the bonds issued. If the money is not repaid by the deadline date, a 10% penalty of the amount outstanding will be issued to the Authority.

Under extraordinary circumstances, the statute allows the contracting authority to request money in excess
of the initial funding limitations from the baseline. The contracting authority may apply for approval to the Department of Community and Economic Development, Department of Revenue and Office of the Budget for additional funding if it is determined the circumstances merit additional funding. Money transferred must be repaid to the General Fund by the contracting authority by the date of final payment of the bonds issued. If the money is not repaid by the deadline date, a 10% penalty of the amount outstanding will be issued to the Authority.

The contracting authority must return excess money not utilized during the calendar year, to the State Treasurer by January 15th following the end of a calendar year for deposit into the general fund. Excess money will be credited to the contracting authority(s) debt account for utilization of repayment of restricted funds borrowed by the contracting authority.

The statute mandates a ratio matching fund requirement. The amount of money transferred from the CRIZ fund utilized for the construction, including related site preparation and infrastructure, reconstruction or renovation of facilities must be matched by private money at a ratio of five CRIZ fund dollars to one private dollar.

By April 1 following the baseline year and each year thereafter, an annual close-out audit will be performed by the contracting authority and provided to the Department of Community and Economic Development, Office of the Budget and Revenue. The audit report will include a detailed account of: the fund money expenditures and private money expenditures with a calculation of the ratio for satisfaction of the matching funds requirement. If it is determined that the matching fund requirement was not satisfied, the CRIZ fund will be adjusted in the next annual transfer to deduct the difference.

**V. CONCLUSION**

Enterprise zones are designed to provide economic development incentives to promote economic growth within a targeted geographical area. Pennsylvania’s newly created City Revitalization and Improvement Zones will provide added financial resources using state tax revenue above a baseline and local tax revenue generated within the Zone to accelerate infrastructure, site preparation, reconstruction or construction of a facility and other economic development projects within the Zone. The expected result is accelerated economic development from leveraged financial resources within certain third class cities of the Commonwealth of Pennsylvania.

**ENDNOTES**

* The authors would like to thank Matt Forti and discussant for their assistance and comments. All possible errors are the author’s.

1. It may be argued that firms in the early stages of growth lack certain resources not due to market failure but due to inadequate ability to attract certain resources given a firm’s high risk for long term profitability. In most cases, though, the lack of up-front resources due to market failure reasons lead to increases in risk and sustainability for a growing firm.

2. Information for the next two sections is substantially from the City Revitalization and Improvement Zones Guidelines (November 2014).

3. Act 47 (Act of 1987, P.L. 246, No. 47) known as the Municipalities Financial Recovery Act, empowers the Department of Community and Economic Development to declare certain municipalities as financially distressed, provides for the restructuring of debt of financially distressed municipalities, limits the ability of financially distressed municipalities to obtain government funding, authorizes municipalities to participate in Federal debt adjustment actions and bankruptcy actions under certain circumstances and provides for consolidation or merger of contiguous municipalities to relieve financial distress.

4. The board of the contracting authority is created under the Municipality Authorities Act (53 Pa. C.S.A. § 5601 et seq.) which specifies that the governing board of the municipality that creates an authority shall appoint at least five members of the authority. Section 5610 of the Municipal Authorities Act (53 Pa. C.S.A. § 5610) provides for the residency requirements of the governing board of the contracting authority. A contracting authority may be created by:

   - A city of the third class with a population of at least 30,000 based upon the most recent federal decennial census, so long as the city has not had a receiver appointed under Chapter 7 of the Act of July 10, 1987 (P.L. 246, No. 47).
   - A city with a population of at least 30,000 based upon the most recent federal decennial census designated as distressed under the Act of July 10, 1987 (P.L. 246, No. 47) that is not located in a home rule county.
• A home rule county where a city with a population of at least 30,000 based upon the most recent federal decennial census designated as distressed under the Act of July 10, 1987 (P.L. 246, No. 47).
• A township of borough with a population of at least 7,000 based on the most recent federal decennial census.

5. Business entities provided in the annual listing by the authority for businesses located in the CRIZ and did not file a state or local tax report are subject to a penalty of 10% of taxes attributable to the zone or $1,000.

6. CRIZ funds may not be utilized for maintenance or repair of a facility.

REFERENCES


FEMALE EMPOWERMENT AND ITS IMPLICATIONS FOR WOMEN’S HEALTH CARE UTILIZATION IN INDIA

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ABSTRACT

Domestic violence against women is a serious public health issue since it has a prolonged negative consequence on maternal and child health outcomes. Using pooled cross section data this paper analyzes the health consequences of women empowerment on young women in India. To test for causality I use an exogenous change in the state laws for inheritance rights as enacted through amendments in the Hindu Succession Act of 1956, as a natural experiment to analyze its effect on female autonomy and their health outcomes. I find evidence that women who were subject to these laws are likely to have a higher probability of seeking antenatal care than those women who were not subject to the law. The results serve policy makers to identify the cost-effective interventions that will improve the social and health status of women in India.

INTRODUCTION

Domestic violence against women is a serious public health issue since it has a prolonged negative consequence on maternal and child health outcomes. According to the United Nations, domestic violence against women includes “physical, sexual or mental harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or in private life” (WHO, 2012). One in every three women is a victim of domestic violence worldwide (ICRW Report, 1999). The related literature finds evidence that spousal abuse can negatively influence maternal and child’s nutritional status for various reasons (see Sethuraman 2008, Campbell et al.1999 and others). One important reason for poor health outcomes among women are due to low or no participation in household decision making (Furuta and Salway, 2006). India presents a unique example of this problem: India is a patriarchal society and is well known for its inegalitarian gender relations. Almost 38 percent of Indian women have experienced physical and/or sexual violence by their intimate partner at some point their life time (UN Women, 2011). In addition, there are significant regional differences in the level of women’s autonomy within the household (Karve 1965 and Altekar 1962). North Indian women have relatively lower autonomy compared to south Indian women (Jejeebhoy and Sathar, 2001).

This paper observes that the position of young married women within the household is a critical determinant of their well-being and in addition, their children’s long-term growth prospects and healthy lifestyle. This paper, therefore, seeks to understand the health consequences of women autonomy on young women in India. Specifically, I study the impact of women’s empowerment on health care utilization among women in India. I proxy women’s autonomy by their inheritance rights and study how these laws impact their health care decisions. The results of the paper can help policy makers identify the cost-effective interventions to prevent or contain the ongoing problems of domestic violence against women in India.

This paper deviates from the existing literature in an important dimension. While the associated impact of domestic violence on mothers’ and their children’s health status is well documented in the related literature, there is scare work, to the best of my knowledge, that analyze how regional differences in the level of female autonomy can influence women’s health care decisions in India. The dataset I use lends itself well to analyzing female autonomy and health care decisions by dividing the sample by regions (five Indian States that made amendments), which will serve to enhance the design of appropriate public health policy interventions. Specifically, to test for causality I use an exogenous change in the state laws for inheritance rights as enacted through amendments in the Hindu Succession Act of 1956, as a natural experiment to analyze these effects. In this respect, this paper fills an important gap in the literature, where there are abundant analyses of domestic violence against women and health status in India but hardly any comprehensive studies that identify how the inheritance laws (proxy for female autonomy) affect their health care decisions.

Using a pooled cross-section individual-level data from the National Family Health Survey of 1998-99 and 2004-05 the paper analyzes the impact of inheritance laws on women’s health care utilization. More specifically, using a probit estimation approach I study whether women who were subjected to these laws have a higher probability of seeking
antenatal care than women who were not subjected to the inheritance laws. There no other studies to the best of knowledge that specifically analyze female autonomy (using the natural experiment) and women’s health care decisions for India. Although Singh and Bloom (2011) analyze a similar question for 8 African countries, their study differs from this study in several ways. For example, they use a bivariate logistic regression estimation approach and a binary outcome measure for female empowerment (based on survey questions on autonomy). Overall, the probit estimation indicates that Indian women who were subject to these laws were likely to have a higher probability of seeking antenatal care than those Indian women who were not subject to the law. The results are however, consistent with the results in a similar study in Africa (Singh and Bloom (2011)).

The paper is organized as follows. Section 2 explains the Hindu Inheritance law and its implications. Section 3 reviews the literature while Section 4 presents estimation methods. Section 5 explains the data, and some important econometric issues. Section 6 presents the results at the individual level and finally Section 7 concludes.

A BRIEF HISTORICAL BACKGROUND OF THE HINDU INHERITANCE LAW

The Hindu Succession Act governs the disposal of the property of intestate Hindus, Buddhists, Jains, and Sikhs. Historically, two legal doctrines governed Hindu inheritance, which later laid the foundation for contemporary Indian inheritance law. These legal doctrines are called as the Mitakshara and Dayabhaga schools of law. The noticeable difference between these doctrines lie in the way it treats property possessed by members of the family. The Mitakshara doctrine distinguishes family’s ancestral or joint property and the separate property of its members while the Dayabhaga doctrine treats all property as separate. Additionally, the Mitakshara doctrine gave only male heirs (three generations, namely sons, grandsons, and great grandsons) the legal right to the ancestral joint family property, with the legal claim of the father. “However, women were entitled to inherit their fathers’ separate property under both the Dayabhaga and Mitakshara schools, but the claims of male heirs and the widowed mother took precedence” (Mathur and Slolov (2013)). Most significant feature of these two doctrines is that women relatively had a disadvantage in property inheritance than men. There are various state level amendments to the Hindu Succession Act that were aimed to reduce bias against women. Specifically, The Hindu Succession Act of 1956 attempted to reduce the bias against women.

After the 1956 Act five Indian states including Kerala (1976), Andhra Pradesh (1986), Tamil Nadu (1989), Maharashtra (1994), and Karnataka (1994) enacted legislation to amend the Act in order to make it more gender neutral. Under these amendments, Hindu women (who were not married at the time the legislation was passed) in these states could get an independent claim to the family’s ancestral property. I use this information to create a measure for the treated group i.e. women who were subject these amendments.

REVIEW OF LITERATURE

Several studies employ the variation of inheritance laws to study its impact on various outcomes including education, autonomy, inheritance of land, aggregate crime measure (see Amarlal (2013), Roy (2008, 2011), Deininger et al. (2013), Mathur and Slolov (2013)). These studies do find evidence that inheritance laws can help improve women’s status and there by improve their bargaining power within the household. For example, Mathur and Slolov (2013) do find evidence that women who were subjected to inheritance laws are less likely to report being victims to domestic violence than women in other states without these laws in place. Amarlal (2013) using state-level crime rates find evidence that the state amendments of the Hindu Succession Act reduce the reported crimes against women at the state level. Finally, Roy (2008) finds that these inheritance laws increases the autonomy with the household. Additionally, Roy (2011) does find evidence that these inheritance laws are positively associated with education attainment of these women.

Another strand of literature that studies the impact of empowerment on health and health care utilization include Zaky et al. (2014), Bloom et al. (2001), Allendorf (2007) and others. For example, Allendorf (2007) finds evidence that women who possess or own land seem to have a positive influence on their children’s nutritional status than mothers who do not own land in Nepal. Using primary data Bloom et al. (2001) investigates the association of autonomy and maternal health care utilization in Varnasi, a northern city in India. They do find evidence that women’s autonomy had a positive impact on maternal health care utilization. Largely, similar studies do predict that female autonomy can have a positive association with maternal health and health care utilization.

ESTIMATION STRATEGY

I use a probit estimation, a standard estimation strategy in this literature to analyze the impact of the underlying amendments of Hindu Succession Act 1956 made in selected states and its effects on maternal health care utilization in India.

The primary model specification is:

$$Y_{it} = \delta_0 + \delta_1 \text{Treated}_{st} + \delta_2 \text{Wave}_{it} + \beta_1 H_i + \beta_2 I_i + \epsilon_i$$

(1)

Where, $Y_{it}$, the dependent variable equals 1 if the woman seeks
antenatal care (proxy for health care utilization) and 0 otherwise. \( Treated_{st} \) is the reform dummy that equals 1 if the woman belonged to the state that passed the amendment act (explained further in section 5) and 0 otherwise. \( Wave_t \) is a dummy variable that denotes the survey round (NFHS 2005). \( H_i \) are a vector of household characteristics and \( I_j \) are individual controls. The primary variable of interest is \( Treated_{st} \). The model predicts that the expected sign of \( \delta \) be positive. The marginal effects of the variable \( Treated_{st} \) (since I use a Probit Estimation) is critical for interpretation i.e. the marginal effects of \( Treated_{st} > 0 \) implies that women who are subject to these amendments tend to have a higher probability to access antenatal care than women who are not subject to these amendments. These amendments serve as exogenous changes in inheritance laws, providing for a natural experiment to identify the casual effects of whether the women who are “treated” experienced better health care utilization than the “untreated” women.

**DATA, DESCRIPTION AND ECONOMETRICS ISSUES**

I use pooled cross-section dataset from the National Family Health Survey (NFHS) 2005-06 and 1998-99 rounds for the analysis. I include the 1998-99 round of the survey to have a larger sample to represent the natural experiment. NFHS is a large-scale, multi-round survey conducted in a representative sample of households throughout India. The survey provides state and national information for India on fertility, infant and child mortality, female autonomy, domestic violence, the practice of family planning, maternal and child health, reproductive health, nutrition, anemia, utilization and quality of health and family planning services. The 2005-2006 survey covers 123,485 women between the ages of 15 and 49 across 29 states from a total of 109,041 households in both rural and urban areas. The 1998-99 survey covers more than 90,000 ever-married women age 15–49 across 26 states.

**Health Care Utilization**

The dependent variable is a measure for health care utilization i.e. antenatal care. The NFHS survey asks women if they seek antenatal care. I construct a dummy variable that takes the value 1 if the woman had some antenatal care during pregnancy and 0 otherwise. Several studies (Hou and Ma (2012), Bloom et al. (2001)) use this measure to proxy for health care utilization.

**Reform Variable**

The reform dummy variable represents the treated group i.e. it takes value 1 if a) the woman lives in the state that passed the amendment act, b) is Hindu and c) was married on or after the reform was passed in her state. The analysis includes women who are Muslims, Christians, Parsi or Jewish in all states but they are the untreated group. I include a \( wave \) variable to I indicate the pooled nature of my dataset.

**Individual and Household Controls**

The NFHS survey estimates a standard of living measure and categorizes households as living in low, medium and high standard of living. I use this measure to create my binary variables for each category. Other household controls include the age of the household head, whether the household is in an urban area, economic variables, religion and caste variables. The individual controls include education variable, occupation, and age of the first marriage. Table 1 reports the summary statistics of the variables used in the analysis. On average, 19 percent of women in the sample were subject to the reform i.e. state amendments to the inheritance laws. However, only about 1% sought for antenatal care.

**ECONOMETRICS ISSUES**

**Causality**

One of the significant issues in a cross-section analysis is establishing causality. I exploit the exogenous variation in state amendments to the Hindu inheritance laws that aimed at pro-gender equality. Additionally, these laws do not apply to women in other religious affiliation and the date of marriage is an important exogenous factor to determine who is in the treatment group for my analysis. All these arguably assist to establish causality.

**Potential omitted variable bias**

Since the dataset is not exhaustive there is a potential threat to omitted variables bias. However, I include all available information and conduct a series of alternate specifications to test for bias. The results however are robust to these alternative specifications.

**RESULTS AND DISCUSSION**

Table 2 presents the Probit regression results. Column (1) is the Probit regression with only the reform variable and column (2) shows the probit results when all controls mentioned in section 5 are included in the regression. The probit estimation shows that the coefficient estimate (marginal effects) of reform variable, the primary interest variable is positive and statistically significant at the 1 percent level. This suggests that women, who are subject to the reform on average, have a higher probability to access antenatal care than women who are subject to these laws. Column (2) includes all other controls and the results are robust to alternative specifications. These results are consistent with other similar studies (see Mathur and Slovav (2013), Bloom et al. (2001)).
Overall, women who have primary education seem to access antenatal care as shown in the results and it is statistically significant at the 10 percent level. However, the analysis indicates that scheduled caste women relative to women in other caste seem to have better access to antenatal care as Muslim women compared to Hindu (the reference category) also seem to have appositive effect on antenatal care. These results are statistically significant at the 1 percent significance level.

CONCLUSIONS

Women’s position within the household may influence their access to maternal health care. Several studies identify that women empowerment can determine women’s health care utilization decisions. Given the cross-sectional nature of the data I use caution in interpreting the results. However, I exploit the exogenous variation of state amendments laws of the inheritance laws as a means to understand the effects of women empowerment and female health care decisions. To test for causal link I use an exogenous change in the state laws for inheritance rights as enacted through amendments in the Hindu Succession Act of 1956, as a natural experiment to analyze its effect on female autonomy and female health outcomes. I find evidence that women who were subject to these laws were likely to have a higher probability of seeking antenatal care than those women who were not subject to the law. The results serve policy makers to identify the cost-effective interventions that will improve the social and health status of women in India.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antenatal Care</td>
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<td>.12</td>
<td>0</td>
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<tr>
<td><strong>Independent Variables</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reform</td>
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<td>Wave (2005)</td>
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<td>.44</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Individual characteristics</strong></td>
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<tr>
<td>Age at First Marriage</td>
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<td>Education- Primary</td>
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<td>Education-Secondary</td>
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<td>Education- Higher</td>
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<td>.16</td>
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<td>Working- Agricultural-Self</td>
<td>.04</td>
<td>.20</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Working- Agricultural-employee</td>
<td>.17</td>
<td>.37</td>
<td>0</td>
<td>1</td>
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<tr>
<td>At home-domestic</td>
<td>.00</td>
<td>.05</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Currently employed</td>
<td>.37</td>
<td>.48</td>
<td>0</td>
<td>1</td>
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<td><strong>Household Characteristics</strong></td>
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<td>Age of the household head</td>
<td>43.18</td>
<td>3.82</td>
<td>12</td>
<td>95</td>
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<tr>
<td>Urban</td>
<td>.43</td>
<td>.50</td>
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<td>1</td>
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<td><strong>Economic Variables</strong></td>
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<tr>
<td>Standard of living- Low</td>
<td>.21</td>
<td>.41</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Standard of living- Medium</td>
<td>.36</td>
<td>.48</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Standard of living- High</td>
<td>.43</td>
<td>.49</td>
<td>0</td>
<td>1</td>
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<td><strong>Caste Variables</strong></td>
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<tr>
<td>Scheduled Caste</td>
<td>.17</td>
<td>.38</td>
<td>0</td>
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<tr>
<td>Scheduled Tribes</td>
<td>.11</td>
<td>.31</td>
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<tr>
<td>Other backward caste</td>
<td>.33</td>
<td>.47</td>
<td>0</td>
<td>1</td>
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<td><strong>Religion Variables</strong></td>
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<td>Hindu</td>
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<td>.11</td>
<td>0</td>
<td>1</td>
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<td>Other</td>
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### Table 2: Probit Regressions; Dependent Variable: Antenatal Care

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<tr>
<th>Variables</th>
<th>Probit Regression (1)</th>
<th>Probit Regression (2)</th>
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<tr>
<td></td>
<td>Coefficient</td>
<td>Coefficient</td>
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<tr>
<td></td>
<td>(p-value)</td>
<td>(p-value)</td>
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<tr>
<td>Reform</td>
<td>0.042***</td>
<td>0.01***</td>
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<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
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<tr>
<td>Wave</td>
<td>-0.02***</td>
<td>-0.02***</td>
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<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
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<tr>
<td>Urban</td>
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<td>-0.005***</td>
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<td>Age at First Marriage</td>
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<td></td>
<td>(.885)</td>
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<tr>
<td>Education-Primary</td>
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<td>(.103)</td>
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<tr>
<td>Education-Secondary</td>
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<td></td>
<td>(0.131)</td>
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<td>Scheduled Caste</td>
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<td>Muslim</td>
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<td>Constant</td>
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<tr>
<td>Psuedo R²</td>
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*Marginal effects of coefficients reported; p-value included in parentheses *, ** and *** represent 10, 5 and 1% significance level respectively. Column (2) includes all other controls including religion and caste variables. Hindu is the reference category for religion, while other caste is reference category for caste.

### Endnotes

1 The terms “autonomy” and “empowerment” are used interchangeably.

1 The content is drawn from Mathur and Slovov (2013) and Roy (2008).

1 “Under this Act, daughters had the same right as sons to inherit their fathers’ separate property, as well as the father’s “notional” share of the family’s ancestral property. However, sons were further entitled to their own, independent share of the family’s ancestral property. Sons were also allowed to request that the ancestral property be divided, while daughters had no such right. While the Act eliminated gender inequality under the Dayabhaga school (which recognized only separate property), it persisted under the more widely used Mitakshara system.” (pp: 9, Mathur and Slovov (2013))

### References


THE DYNAMICS OF IMMIGRATION, CULTURE, AND MORALITY

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ABSTRACT

Historical changes in immigration are linked with cultural transformations in the understanding of morality as reflecting fairness and in-group orientation. We utilized the years 1820 through 2009 US immigration data and the proximity of words drawn from books published in the US in corresponding years to investigate. Our findings indicate an increase in immigration causes a decrease in the published literature in notions of morality as fairness words. The influx of immigrants has mixed effects on the perception of morality as in-group words in the short run, but the effects diminishes in the longer run. We obtain evidence that increases in notions of morality as fairness cause decreases in the salience of in-group morality. Our findings have implications for the burgeoning literature on population heterogeneity and public welfare, and our methods illustrate how demographic trends can be linked to cultural changes.

INTRODUCTION

In recent years political scientists (e.g. Putnam, 2007) and economists (e.g. Alesina and Giuliano, 2009; Costa and Kahn, 2003) have reported findings indicating that various types of diversity (ethnic, country of origin, and racial) within communities and countries is inversely related to political trust, civic participation, and the provision of public goods. This pattern is hypothesized to result from difficulties posed by diversity in perceiving joint interests with dissimilar others, consequently inhibiting a commitment to, and action on behalf of, a common good. The causal role of diversity has been examined through longitudinal research in which changes in diversity, often occasioned by immigration, are linked to changes in civic sentiment and behavior (e.g. Kesler and Bloemraad, 2010). The empirical associations of various forms of diversity with facets of civic life appear regularly enough in research to conclude that genuine connections exist, although the processes that connect demographics to behavior are not yet fully clear.

In this paper, using time-series analyses, we would like to examine the possibility that fluctuations in diversity resulting from year-to-year variations in U.S. immigration affect cultural understandings of morality. Specifically, we test the impact of immigration on the salience of two classes of moral values, morality as fairness and in-group morality, which have direct implications for understanding the connections of diversity to civic life. Morality as fairness and in-group morality have been proposed by Haidt and his colleagues as two of the five broad moral foundations that are the basis for moral judgments around the world. These five foundations (Graham, Haidt, and Nosek, 2009) are morality as fairness, signaled by the concern for justice and reciprocity; in-group morality, centered around values of loyalty and patriotism; morality of harm and care, revealed in empathy and nurturance; morality of authority is reflected in obedience to and respect for hierarchies; and, finally, morality of purity is seen most clearly in concerns for contamination and carnality. Haidt (2007) and his colleagues have demonstrated that the moral foundations can be distinguished through different kinds of measurement, appear in different cultures, and add to predictions of a range of theoretically related attitudes and behaviors.

Morality as fairness and in-group morality are the foundations most relevant to the hypotheses to the work concerning diversity’s effects on culture. Immigrants, for example, “challenge social solidarity” (Putnam, 2007) that is fundamental to in-group morality. Moreover, diversity is
hypothesized to lower trust and reciprocity, key elements of morality as fairness. As heterogeneity resulting from immigration increases, the construal of morality as a matter of fairness is likely to decrease. A variety of experimental studies in psychology and economics (e.g., Hoffman, McCabe, and Smith, 1996) have demonstrated that behavior and judgment reflecting concern for fairness are most likely to occur in social contexts in which social distances among individuals are reduced. Populations in which many are natives of different countries will tend towards greater social distances among individuals, and consequently more fragmentation, than in populations in which everyone was born in the same country.

While the effects from immigration on the perception of morality are important, we also would like to examine how the local perception of morality as fairness and as in-group affects each other. Immigrants bring in new culture to the domestic society; however, the new culture can be intertwined with the existing culture. The different perceptions of morality have been long existed in the domestic society and they may affect morality understanding via interactions among individuals and communities. The dynamic relationships between immigration and different perception of morality can be illustrated in Figure 1.1. The arrows used in the figure represent the causal relationships we would like to explore empirically in this study.

To analyze these causal relationships, we draw upon a very large public data set capturing cultural meanings and link this data set to immigration records in the United States. We also illustrate an approach for understanding cultural changes likely useful to researchers in many fields. To assess cultural currents in the United States, we made use of millions of scanned books published since 1850 (this data set is described in the next section). This corpus of words has already been used to reveal important cultural trends (Mischel et al., 2011). For each year between 1850 and 2009 we calculated the proximity of a class of words previously identified as linked to the belief that morality is based on group solidarity and nation-state traditions with a class of words suggestive of the moral domain (Graham, Haidt, and Nosek, 2009). Proximity between words in texts is known to reveal semantic similarity (e.g., “hot”, “warm”) rather than sequential information (e.g., “hot”, “dog”; see Lund and Burgess, 1996; Netzer, Feldman, Goldenberg, and Moshe-Fresco, 2012 for recent demonstrations). High proximity of words linked to the concept of morality with that connoting group fidelity suggests that the two are linked semantically; this is what would be expected if morality is understood to be embedded in the cultural traditions of the society of which one is a member. Conversely, low proximity between “moral” and “in-group” words indicates that connotations of the moral sphere do not reference as foundational solidarity and community.

Following the same logic, for each year we calculated the proximity of a class of words previously identified as linked to the belief that morality is a matter of justice and fairness with a class of words suggestive of the moral domain (Graham, Haidt, and Nosek, 2009). High proximity suggests an understanding of morality tightly integrated with principles of justice and fairness; low proximity suggests morality is understood to be independent of notions of justice and fairness. We predicted the proximity of moral and in-group words would decrease, and that the proximity of fairness words and moral words would decrease, as the number of immigrant increases. Note the effect of immigration on cultural notions of morality is likely to be fairly rapid, but our method of capturing this effect - analyzing published texts - means the effect will lag by the year necessary to write and publish a book. Imagine, for example, an American populace in 1907 experiencing an unusually large influx of immigrants (Figure 2.1). The wave of new residents with different customs and languages awakens in the populace an awareness of differences among groups which in turn depresses the belief that moral conduct is regulated by national norms and communal good will, with authors incorporating this cultural understanding into their manuscripts that are bought and set into print by publishers.

The impact of the 1907 wave of immigration must first alter the views of the population, then shape the manuscripts written by authors, which then must be edited and published, a process that ensures that the effect of the 1907 immigration pulse will not be detectable in the published literature until years later. It is difficult to be precise about how many years of delay there will be between a spike of immigration and its likely reflection in published books, but our assumption is that a lag of several years is likely. This period of time includes the influence on culture of the immigration shock, the incorporation of salient understandings of morality into a book manuscript, negotiations with and editing by a publisher, and then the time necessary for an edited manuscript to be published. This means when we seek to detect an association among population heterogeneity, in-group morality, and morality as fairness, we are most interested in values of population heterogeneity lagged several years prior to the measurement of the two cultural understandings of morality.

To summarize, we propose that population heterogeneity has negative impacts on the proximity of moral and in-group words and moral and fairness words. Meanwhile, the mutual impacts from the local/existing perception of morality may also reduce the strength of each perception of morality over time. These proposals seem reasonable, but careful statistical investigation is needed to provide a support to such proposals.

Finally, it is important to indicate the uni-directional arrow from immigration to both perception of morality used in
Figure 1.1 does not imply the opposite causal relationships don’t exist. It could be the perception of morality as fairness and in-group that brings in more immigrants. However, this is another issue for future exploration.

The paper proceeds as follows. Section Two provides the sources of the data and explains how the data is collected and created. Some stylized facts regarding the data will also be presented graphically. Section Three presents the empirical methods applied in this study that include impulse response function and forecast error variance decomposition analysis. Both of them are derived from a well-designed vector autoregressive model. Section Four reports the results from both analyses. Section Five offers summary and concluding remarks.

**DATA AND GRAPHICAL PRESENTATIONS**

Using optical character recognition (OCR), Google has digitized over 15 million books, of which over five million were selected for inclusion in a database based on the high quality of the OCR data and the presence of metadata such as location and year of publication (Mischel et al., 2011). Data for this study come from all books in this database published in the United States between 1820 and 2009. These data are publicly available and can be downloaded from [http://books.google.com/ngrams/datasets](http://books.google.com/ngrams/datasets).

In this data set, a string of characters that is uninterrupted by a space or punctuation is called a 1-gram. With some exceptions (e.g., numbers, punctuation, hyphenated words), a 1-gram corresponds to an English word; a sequence of five consecutive 1-grams is called a 5-gram. To prevent copyright infringement, the books have been divided into 5-grams, which makes it difficult (if not impossible) to reconstruct the full text of each book.

To identify 5-grams containing moral words and 1) in-group words, and 2) fairness words, we used dictionaries developed by Graham, Haidt, and Nosek (2009). These dictionaries contain words and word stems representative of morality in general, and dictionaries representative of virtue and vice for what Haidt (2007) has labeled 1) ingroup/outgroup and 2) fairness/reciprocity. We matched our modified dictionaries (see the Appendix) to the 5-gram data. For each 5-gram, we creating dummy codes (0 = absent; 1 = present) for the general moral words and for the ingroup/outgroup words. We cross-tabulated these dummy codes calculating the Jaccard proximity score for each year from 1820 to 2009. This yields a measure of the proximity of morality words to ingroup/outgroup words for each year; this proximity is labeled in-group morality. The same procedure was used to estimate the proximity of moral and fairness words, resulting in an index of morality as fairness.

U.S. Department of Homeland Security data were the basis for the number of immigrants entering the country for each year. Total population of the United States was drawn for census years from U.S. Census figures, with the population for years between decennial censuses interpolated. Heterogeneity is calculated by dividing the number of new legal residents by the population total for the year.

**Some Facts from Visual Observation**

Both morality indices (Jaccard score) are too small and are multiplied by 100 to make them easier to inspect. We denote three main variables as “Het” (immigration measured by population heterogeneity), “Fair” (perception of morality as fairness words), and “Ingroup” (perception of morality as in-group words). These three variables are plotted in Figure 2.1-2.3.

As is evident in Figure 2.1, population heterogeneity was quite volatile and large before the Great Depression period; there seemed to be a slow but steady positive trend afterwards. The perception of morality as fairness words trended upwards before 1950s, but inverted after that. The perception of morality as in-group words had fluctuated at the same level before 1900s, but it started to decline continuously after that period.

We also create pair-wise diagrams for uncovering possible associations. Figure 2.4 and 2.5 show the relationship between immigration with each perception of morality. It is not easy to discern any specific pattern in both figures, however, both cultural notions showed less year-to-year fluctuation following the Great Depression in 1930s, as did population heterogeneity. Figure 2.6 presents two different perception of morality over the sample period. It seems the perception of morality as in-group words was a more dominant view before early 1900s. In this period, both perception of morality fluctuated around their rivaled resealed index average, 0.3763 for in-group and 0.4533 for fairness. After early 1900s, the perception of morality as in-group words revealed a significant downward trend. On the other hand the perception of morality as fairness words had a mild increase till 1950 and started to show a downward trend after that.

From all the above graphical presentations, we learn that the interactions between immigration and different perception of morality are quite complex and dynamic. In order to explore these dynamic relationships and uncover their patterns, there is a need to use a more sophisticated statistical technique. The empirical methods are introduced in the next section.

**EMPIRICAL METHODS**
To analyze the dynamic relations among population heterogeneity (Het), the perception of morality in terms of fairness (Fair) and in-group (Ingroup) words more closely, we utilize a vector autoregressive model (VAR) that was popularized by Economics Nobel Prize winner Dr. Christopher Sims (1980). As indicated in Figure 1.1, we assume that these three variables (Het, Fair, and Ingroup) are endogenous, meaning that their values are decided within a system. The assumption of endogeneity is reasonable since all three variables exist in an open society.

Next, based on some preliminary empirical results on the VAR model, we apply Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) analysis. Impulse response function method is commonly used in the engineering field to assess how a simulated shock affects the system. We generate such shocks from the residuals of each equation in the VAR model and examine how each endogenous variable (Het, Fair, and Ingroup) responds to the shocks. The use of IRF allows us to observe, for example, how the change in immigration (Het) affects the perception of morality in terms of fairness (Fair) over time. The Forecast Error Variance Decomposition method, according to the name, decomposes the variation of each endogenous variable into various shocks. For instance, we can assess how the change in the perception of morality in terms of fairness is affected by the shock from immigration (shock in Het), perception of morality in terms of in-group words (shock in Ingroup), and its own shock (shock in Fair).

**Vector Autoregressive Regression Model**

The dynamics among immigration measured using population heterogeneity (Het), perception of morality in terms of fairness words (Fair), and perception of morality in terms of in-group words (Ingroup) can be summarized in a column vector W as follows:

$$W_t = (\text{Het}_t, \text{Fair}_t, \text{Ingroup}_t)^T$$

(1)

“T” in equation (1) is the symbol for transposing vectors/matrices. The standard approach in a multivariate time series model is (a) to examine the stationarity of each variable in the system, and (b) to decide whether variables should be differenced before entering into the Vector Autoregressive Regression (VAR) model or whether an alternative model, Vector Error Correction Model (VECM), should be adopted. Our preliminary tests (i.e., Unit Root tests, Johanson test, and etc.) results indicate that a VAR system incorporating the differenced variables is most appropriate.

We build a vector autoregressive (VAR) model as follows:

$$\Delta W_t = \mathbf{A}_0 + \sum_{j=1}^{k} \mathbf{A}_j \Delta W_{t-j} + \epsilon_t$$

(2)

Where $E(\epsilon_t, \epsilon_j) = \Omega$

W is a 3x1 column vector that represents our target variables and $\Delta$ is the first difference symbol. $\mathbf{A}$ is a 3x3 coefficient matrix that represents either intercepts ($\mathbf{A}_0$) or is attached ($\mathbf{A}_j$) to lagged $\Delta W$. “$\epsilon$” is a 3x1 vector and each represents an error term; it can also be interpreted as a shock or disturbance to the system (VAR). The usefulness of VAR is that it allows contemporaneous relationships in the error term and consequently increases the estimation efficiency.

To make the model more explicit, we expand the first equation in our VAR below:

$$\Delta \text{Het}_t = \mathbf{A}_{10} + \mathbf{A}_{11} \Delta \text{Het}_{t-1} + \mathbf{A}_{12} \Delta \text{Fair}_{t-1} +$$

$$\mathbf{A}_{31} \Delta \text{Ingroup}_{t-1} + \mathbf{A}_{32} \Delta \text{Het}_{t-2} + \mathbf{A}_{33} \Delta \text{Fair}_{t-2} +$$

$$\mathbf{A}_{32} \Delta \text{Ingroup}_{t-2} + \cdots + \mathbf{A}_{1k} \Delta \text{Het}_{t-k} +$$

$$\mathbf{A}_{3k} \Delta \text{Fair}_{t-k} + \mathbf{A}_{31} \Delta \text{Ingroup}_{t-k} + \epsilon_{1t}$$

(3)

$\mathbf{A}_{ij}$ represents coefficient in the model; $i = 1, 2, 3$ that corresponds to Het, Fair, and Ingroup, respectively; $j = 1…k$ that indicates the time lags.

**Impulse Response Function Analysis**

Given that all the differenced variables in the VAR are stationary, equation (2) can be reformulated as follows:

$$\Delta W_t = \mu + \sum_{j=1}^{\infty} \phi_j \Delta \epsilon_{t-j}$$

(4)

Where $\phi_j$ is termed impact multiplier; $j = 1…\infty$ indicates the time lags. We present the first equation in (4) as follows:

$$\Delta \text{Het}_t = \mu_1 + \phi_{11} \Delta \epsilon_{1,t-1} + \phi_{12} \Delta \epsilon_{2,t-1} + \phi_{13} \Delta \epsilon_{3,t-1} + \phi_{14} \Delta \epsilon_{4,t-1} +$$

$$\phi_{21} \Delta \epsilon_{2,t-1} + \phi_{22} \Delta \epsilon_{3,t-1} + \phi_{23} \Delta \epsilon_{4,t-1} + \cdots$$

(5)

Similar to equation (5), the respective differenced Fair and Ingroup variable can be expressed as a function of differenced error terms. The index used in notation $\phi_{ij}$ in equation (5) specifically indicates that how the shock from the $i^{th}$ variable in $j^{th}$ period ago affects the current Het
variable. The size of impact multiplier $\phi_i$ needs to be estimated. Based on equation (5), we can generate such standardized shock using bootstrap approach to observe how each target variable (Het, Fair, or Ingroup) responds to the generated shock gradually (i.e., Cumulative IRF) over time. For example, we can generate a one-unit shock in population heterogeneity ($\delta_{het}$) and inspect how the perception of morality in terms of fairness (Fair) responds to it over time. This method simplifies a complex system and allows each endogenous variable to be affected by one unique shock while holding other shocks constant. As equation (5) can be updated based on the timing of the shock, the IRF analysis can be used as a forecasting tool as well.

**Forecast Error Variance Decomposition Analysis**

While the IRF analysis reveals the dynamic response of each endogenous variable to shocks, the Forecast Error Variance Decomposition (FEVD) analysis tells us the proportion of the movements in an endogenous variable due to its "own" shocks versus shocks from the other variables. For example, based on FEVD outcome, we can conclude that x% of variation in the perception of morality in terms of fairness words in due to population heterogeneity shock.

**EMPIRICAL TESTS & THEIR RESULTS**

**Autocorrelation Analysis**

Instead of jumping to the main results of Impulse Response Function and Forecast Error Variance Decomposition Analysis methods, we calculate some basic statistics of the endogenous variables. The main statistic method we use is autocorrelation coefficient and is defined as follows:

$$\rho_{UV}(\ell) = \frac{\text{Cov}(U_t, V_{t-\ell})}{\text{Var}(U_t)\text{Var}(V_t)}$$  \hspace{1cm} (6)

$\rho$ measures the correlation between any pair of variables $U$ and $V$ over time; where the symbol “Cov” and “Var” represents covariance and variance, respectively. The symbol “ $\ell$ ” is the time index and $\ell \geq 0$. For example, selecting a pair of endogenous variables, say Het and Fair ($U = \text{Het}, V = \text{Fair}$). If $\ell = 2$, then the autocorrelation coefficient measures the following:

$$\rho_{\text{Het,Fair}}(2) = \frac{\text{Cov}(\text{Het}, \text{Fair}_{-2})}{\sqrt{\text{Var}(\text{Het}_t)\text{Var}(\text{Fair}_t)}}$$  \hspace{1cm} (7)

The above result is interpreted as the correlation coefficient of current Het ($X_0$) and lagged Fair ($\text{Fair}_{-2}$) variable. Table 1 shows the concurrent ($\ell = 0$) and cross correlations ($\ell = 1$–7) among paired Het, Fair, and Ingroup variables. The selection of lag $\ell$ is based on the optimal lags used in the VAR system. Figure 1.2 and the corresponding Table 1 present these autocorrelations. To examine the magnitude of these autocorrelations, let us look into Table 1. The first row in Table 1 represents the variables measured at current time and variables in columns represent the same variables with different time lags. Accordingly, $\rho_{\text{Het, Fair}}(2) = -0.53$ and $\rho_{\text{Fair, Het}}(2) = -0.55$ as shown in the table; they are not necessarily equal. Table 1 indicates that the autocorrelations between Het (current) and Fair (current & lagged) and Het (current) & Ingroup (current & lagged) are negative and positive, respectively. The autocorrelations between Fair (current) and Het (current & lagged) and Fair (current) and Ingroup (current & lagged) are negative, respectively. The autocorrelations between Ingroup (current) & Het (lagged) and Ingroup (current) & Fair (lagged) are positive and negative, respectively. The autocorrelations reveal that the current changes in population heterogeneity has a negative (positive) association with the perception of morality in terms of fairness (in-group) words over time. Meanwhile, the current changes in the perception of morality in fairness (Ingroup) words have a negative association with the perception of morality in ingroup (fairness) words as well. The outcomes of autocorrelation analysis reveal the following. Firstly, more immigrants reduce the concern of justice and reciprocity (fairness), but reinforce the concern of loyalty and patriotism (in-group). Secondly, different perceptions of morality have negative associations; those who consider morality as fairness have a negative association with those who believe in-group morality and vice versa. The autocorrelation analysis evaluates an unconditional association between a pair of variables. However, the association between variables can be quite different when autocorrelation coefficient is measured conditionally.

In order to investigate how different perception of morality as fairness and ingroup words change over time when facing shocks from new immigrants and the shocks from both perception of morality, we apply the IRF and FEVD analysis and report the outcomes as follows.

**Impulse Response Function Analysis**

A standard one-unit population heterogeneity shock is generated and the responses from both perception of morality are reported in Figure 3.1 and 3.2, respectively. Figure 3.1 shows that the perception of morality in terms of fairness words has been negative over time and it converges after about 13th period. This outcome indicates that the influx of immigrants has a negative impact on the perception of morality as fairness. Figure 3.2 shows that, given the one-unit
population heterogeneity shock, the perception of morality as in-group words is mixed in the first ten periods; it was positive in earlier period and then turned into negative. Nevertheless, it diminishes and converges to zero after the 10th period. This outcome indicates that the perception of morality as in-group words responds to the new immigrants differently earlier, yet there is no long-term impact. This outcome reveals the danger of using autocorrelation analysis can be misleading since it shows that more immigration should reinforce the concern of loyalty and patriotism (in-group).

By the same token, a standard on-unit shock from the perception of morality as in-group words is generated. Figure 3.3 shows that the responses from the perception of morality as fairness words are mostly negative and converging at a negative-value level. In the end, we also generate the same shock from the perception of morality as fairness words. The outcome also reveals that the perception of morality as in-group words have been negative over the period. Both outcomes show that there are mutual offsetting effects from different perception of morality. While the outcomes are consistent with the autocorrelation measurements we found earlier, the impulse responses outcome is only significant for the responses of perception of morality as in-group words when facing the shock from a different morality perception (i.e., fairness). The confidence band used to detect significance is generated using bootstrap approach where the null hypothesis is \( \phi_{ij} = 0 \) against the alternative hypothesis \( \phi_{ij} \neq 0 \).

**Forecast Error Variance Decomposition Analysis**

The outcomes shown in Table 2.2 and 2.3 are the main focus since the key variables we would like to study are about the perception of morality. Table 2.2 shows that, after 20 periods, 6.58% of variation in the perception of morality as fairness words can be explained by immigration. Meanwhile, 1.56% of the variation in morality as fairness words can be explained by the other moral perception, in-group morality. The variation of the perception of morality as in-group words, as reported in Table 2.3, can be explained by immigration and the other perception of morality. Their magnitudes are 11.48% and 12.09%, respectively. The graphical presentation about the Forecast Error Variance Decomposition Analysis can be found in Figure 3.5. Different shade of colors is used to explain the variation components in each variable.

**CONCLUSIONS**

Although our findings do not fully support our proposed hypothesis, they are mostly consistent with arguments by political scientists and economists that population heterogeneity increases social distance and concern for the public good. In our study, as population heterogeneity increased, the cultural understanding of morality became more distant from notions of fairness, as reflected in the decreasing proximity of moral and fairness words in books published at the time. Meanwhile, population heterogeneity has mixed impacts on the semantic similarity of the words community and moral, which we interpret as an indication that population heterogeneity resulting from immigration may lead to both increase and decrease cultural understanding of morality as embedded in groups of individuals sharing cultural traditions, norms, and values. However, our empirical result also shows that the impact from immigration on the perception of in-group morality disappears in the long run. Finally, local/existing perception of morality as fairness has a negative effects on the perception of in-group and vice versa.

It is fascinating that the philosopher John Rawls (1971) and the psychologist Lawrence Kohlberg (1969), both Americans and enormously influential advocates for notions of fairness as central to moral understanding, reached their peaks of eminence in the 1960s and 1970s. As we documented in Figure 2.6, immigration was low in this period of American history, and fairness and morality were commonly linked in published work of the time. Our findings are consonant with the interpretation that the works of Rawls and Kohlberg were timely, cresting with cultural and demographic trends that increased the resonance of a focus on fairness. As the cultural and demographic contexts shifted into the last years of the 20th century, currents of philosophy and psychology attentive to embedded morality gained visibility. For example, communitarianism, a line of philosophical theorizing that asserts moral meaning must be understood within the contexts of specific cultures and communities, is viewed to have emerged as a reaction to, and following after, Rawls’ work (Bell, 2012). Communitarianism was also developing during the years in American history when—as Figure 2.6 indicates—immigration was increasing, as was the binding of moral and community in the published books of the time.

Our data and analyses imply strong causal claims. However, it is necessary to point out the outcomes in three of the four impulse response function analysis are statistically insignificant. Overall, our study reveals that important demographic trends can be linked to cultural currents reflected in very large, publicly available data sets. Specifically, our findings demonstrate that in the United States, during historical periods of high immigration, book authors discuss morality in ways that give short shrift to notions of fairness and highlight the importance of communities for appreciating moral life. It is our belief that identifying these links strengthens the nomological network of demographics, history, and culture.
### Table 1. Autocorrelation

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### Table 2. Forecast Error Variance Decomposition Outcome

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Figure 2.1

Heterogeneity

Figure 2.2

Fairness
ENDNOTES

1. https://www.dhs.gov/sites/default/files/publications/imigration-statistics/yearbook/2012/LPR/table1.xls. We used census data, and interpolated for years between decennial censuses, for the total population of the country. For censuses in the 19th century, we used data from ICPSR (study 02896) to estimate percent foreign born. Estimates for the 20th century were drawn from Census Bureau table 02HS0010 (www.census.gov/statab/hist/02HS0010.xls). The estimate for 2010 is from Census Bureau table 12s0040 (http://www.census.gov/compendia/statabcats/population/native_and_foreign-born-populations.html).


3. Following the standard time series analysis research routine, we first conducted the unit root tests to decide whether the variables are stationary. Secondly, Johansen tests are applied in the VAR model to decide whether there exist cointegrating vectors. We used two unit root tests; the ADF (augmented Dickey-Fuller, Said, and Dickey, 1984) test and KPSS (Kwiatkowski-Phillips-Schmidt-Shin, 1992) test were developed to detect the existence of unit roots in individual time series, though these two tests were based on the opposite null hypothesis. Our results indicate that all three variables are integrated of order one, I(1), which means they are non-stationary. Johansen and Juselius (1990) and Johansen (1992) used a two-step full-information maximum likelihood method and derived the tests (i.e., trace test and maximum eigen value test) to detect the number of cointegrating vectors. Both tests did not find the existence of cointegrating vectors. Therefore, the differenced variables are included in the VAR model.

APPENDICES

General Moral Words: righteous*, moral*, ethic*, value*, upstanding, good, goodness, principle*, blameless, exemplary, lesson, canon, doctrine, noble, worth*, ideal*, praiseworthy, commendable, character, proper, laudable, correct, wrong*, evil, immoral*, bad, offend*, offensive*, transgress*


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INFLUENCING FACTORS ON THE CHOICE OF UNDERGRADUATE BUSINESS MAJOR AND THE ROLE OF GENDER

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ABSTRACT
Previous research by the authors of this study has uncovered an unsettling trend in college demographics with significant consequences for colleges of business, industry, and the national economy. Despite an increase in the number of male students enrolled in business programs across the U.S, female representation is declining. The present study explores why. We surveyed undergraduate business school freshmen to identify the influences that lead them to study business and whether these factors differ by gender. The survey analyzes internal factors, external factors, and social/interpersonal influences. Preliminary results suggest that male and female business students are largely influenced by the same factors when choosing their college major. A follow-up discussion explores subtler factors and suggests alternative ways for colleges of business to increase female enrollment.

Keywords: Female enrollment, college major, gender gap in business programs, women in business.

INTRODUCTION
Numerous studies have investigated gender differences within and between different college majors. However, there is a lack of research on gender enrollment trends in undergraduate business schools (UBS) and factors that lead students to major in the field. In 2012, the authors of this study reported on gender matriculation trends in UBS at public universities in Pennsylvania between 1995 and 2008. The study found that the enrollment of female students in business programs declined despite increased female enrollment at Pennsylvania public universities (Davis & Geyfman 2012). In a follow-up study, the authors explored whether the state trend extended nationally by examining female representation in U.S. schools accredited by the Association to Advance Collegiate Schools of Business (AACSB) (Davis & Geyfman, 2015). Findings indicated that male enrollment increased in AACSB-accredited colleges, but female representation declined. The study also found that economic incentives and “female friendly” institutional factors (such as lower faculty-student ratio, smaller average class size, and larger female faculty representation) tended to increase female representation at UBS. Building off these previous studies, the primary purpose of the present paper is to explore why students choose to study business and whether the factors that influence this decision differ by gender.

LITERATURE REVIEW
Previous studies have explored the factors that influence a student’s choice of major and gender differences (Malgwi, Howe & Burnaby 2005; Turner & Brown 1999; Zafar 2013). Several studies analyzed the factors that lead students to choose a specific major within a larger discipline, e.g. accounting in a college of business (Downey, McGaughey, & Roach 2011a, 2011b; Kumar & Kumar 2013; Roach, McGaughey, & Downey 2011). Overall, these studies suggest that the factors influencing major choice differ depending on the group. These studies offer descriptions of the types of influences that guided our
We began by examining students’ internal motivations. These factors include student interest and perceived aptitude in a field. Several studies have found interest or “fit” to be an important factor for all students across a range of disciplines (Beggs et al. 2008; Kim, Markham, & Cangelosi 2002; Malagwi et al. 2005; Roach, et al. 2011; Wiswall & Zafar 2011; Wiswall & Zafar 2014). However, another study conducted by Kumar and Kumar (2013) found that interest was not an important factor for students who major in business. In contrast, aptitude in the subject area – especially for women – appears to be most important to business students (Kim, et al. 2002; Kumar & Kumar 2013; Malgwi et al. 2005; Wiswall & Zafar 2011).

The second category of influences consists of social factors such as family, school counselors, or friends. Kumar and Kumar (2013) found that friends and professors are more influential for male students, while females give more weight to the opinions of high school advisers and family.

External influences form our third category. For example, income has been found to influence students in all majors (Beggs et al. 2008; Montmarquette, Cannings, & Mahseredjian 2002). Future earnings were particularly important for business majors (Kim et al. 2002; Mauldin, Crain, & Mounce 2000), and were more important to men than to women (Malgwi et al. 2005; Wiswall & Zafar 2011). Job availability and security are two additional external influences that seem to be important to undergraduates (Beggs et al. 2008; Kim et al. 2002; Kumar & Kumar 2013; Roach et al. 2011).

**HYPOTHESES, METHODOLOGY, AND TESTING**

The first group of variables pertains to the internal influence of aptitude. We collected data on the number of quantitative and business courses that students took during high school and their perceived aptitudes in these disciplines. We analyzed these results both as totals and by gender to test prior research findings suggesting that students tend to pursue majors that they believe fit with their abilities and aptitudes (Downey et al. 2011a; Roach et al. 2011).

**Hypothesis 1:** Students’ perceived aptitudes/abilities in quantitative and business disciplines strongly influence whether they choose business as a major.

**Hypothesis 1a:** These perceived aptitudes/abilities differ for male and female students.

We also tested importance of students’ personal interest in business by testing the following hypotheses:

**Hypothesis 2:** Interest in the subject is a significant factor for all students majoring in business.

**Hypothesis 2a:** Interest in the subject is more important to female than male students.

Additionally, we explored the effects of social influence from parents, teachers, counselors, and friends.

**Hypothesis 3:** Social, interpersonal influencers (parents, teachers, counselors, and friends) play a significant role for all students when choosing a business major.

**Hypothesis 3a:** Male and female students tend to value different types of interpersonal influences.

We also evaluated two external influences: projected salary and job availability.

**Hypothesis 4:** Future salary and job availability play a significant role for all students when choosing a business career.

**Hypothesis 4a:** These factors are more important to male than female students.

Porter and Umbach (2006) found that college majors tend to attract similar types of students (eg: most English majors are similar to one another), which suggests that women may be drawn to programs where there are other female students. Thus, this study also assesses whether the number of fellow women in business influences female students’ decision to pursue this career track. We tested the following:

**Hypothesis 5:** For female students, the number of women in business has a significant impact on major choice.

In order to test these hypotheses, we administered a survey to all incoming business freshmen at a Northeastern U.S. university with an enrollment of approximately 10,000 students. The university has an AACSB-accredited business program with 1705 students, 4 departments, and 6 disciplines.

The survey was administered at an orientation session before the semester began. To remove the subjectivity
of the interviewers and provide anonymity, researchers used a self-administered survey. However, faculty advisers were present and available to respond to any questions. The survey asked students for basic demographic information, as well as details about internal influences, academic and career preparation, quantitative and business courses taken in high school, and their self-assessments of their abilities in these courses. It also asked students to rank the importance of various external and social influences. The response rate was 90%; 253 questionnaires out of the 280 that were distributed were fully completed and analyzed. 152 males and 101 females chose to participate. Table 1 lists general demographic characteristics of survey participants.

PRELIMINARY RESULTS

Our preliminary results are reported in Table 2. The results indicate that students generally ranked their quantitative and business aptitudes at high levels, suggesting that that they felt confident in their business abilities, supporting Hypothesis 1. However, female students were less self-assured than their male counterparts. The differences were statistically significant, thus lending support to Hypothesis 1a.

Our findings also confirm Hypothesis 2. Both male and female students ranked interest in the subject area as the primary factor affecting their career choice. Female students placed slightly more importance on interest than males, but the difference was not statistically significant. Thus, Hypothesis 2a was rejected.

The data support Hypothesis 3 because social influencing factors were significant for both men and women. Students consistently ranked the importance of parents and guardians above that of teachers, counselors, and friends. However, men and women placed approximately equal value on each of these social influences. Thus, Hypothesis 3a was not supported.

Future salary and job availability ranked second and third (respectively) following interest for both genders, supporting Hypothesis 4. Salary was slightly more important to male students, (supporting Hypothesis 4a), but job security was more important for female students. In both cases, the difference was not statistically significant.

Finally, the number of women in the program and in business did not seem to play an important role for the female students’ decision at least at this stage of their academic career. Thus, Hypothesis 5 was rejected.

DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

Our results are mostly consistent with previous research on why students choose to major in business (Downey et al. 2011a, 2011b; Kim et al 2002; Roach et al. 2011; Kumar & Kumar 2013; among others). Generally speaking, business students choose majors that match their abilities and that interest them. Social influences – parents, teachers, counselors, and friends – are important for both genders. We found that parents were central in students’ initial major selection, but did not have as much of an influence on their ultimate career choice. As for external influences, most business students -- especially males -- based their major decisions largely on potential earnings, and both genders were sensitive to the issue of job availability.

The most important aspect of this study, however, may be examining the findings within a broader context that considers the overall decline in undergraduate women studying business. We did not find a strong difference in the variables that influence men and women to study business. To the contrary, our preliminary findings suggest that female students are motivated by the same factors as their male counterparts.

However, we cannot conclude that gender has no effect on why students major in business. Further analysis and future studies should focus on finding more subtle differences between men and women.

Another crucial finding is that female respondents in this study were less confident in their quantitative abilities than their male counterparts. As was stated, previous research found that aptitude in the subject area influences all students (Kim et al. 2002; Kumar & Kumar 2013), but women more so (Malgwi et al. 2005; Wiswall et al. 2011). Perhaps finding ways to improve women’s quantitative skills and boost their confidence may increase female enrollment in
business programs.

Our findings also affirm that social influences are important to both genders, particularly when first selecting a major. Interestingly, when we asked female students whether the presence of other women in business affected their decision to major in the field, they did not feel that it did. Perhaps, this is because female students have not yet been exposed to particularly successful businesswomen. Colleges of business may draw more female students by inviting prominent female business leaders to speak and offer workshops. Further research on these topics in relation to gender may help colleges formulate strategies to combat the declining female enrollment in business programs.

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Table 1. Demographic Information

<table>
<thead>
<tr>
<th>COB total</th>
<th>253</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Male=152, Females=101)</td>
</tr>
<tr>
<td>Highest education attained by father</td>
<td>HS/Associate/BA/MA/Doctorate/NA</td>
</tr>
<tr>
<td></td>
<td>108/34/59/32/5/11</td>
</tr>
<tr>
<td>Highest education attained by mother</td>
<td>HS/Associate/BA/MA/Doctorate/NA</td>
</tr>
<tr>
<td></td>
<td>88/46/73/35/0/5</td>
</tr>
<tr>
<td>Family owns business</td>
<td>118</td>
</tr>
<tr>
<td>Who owns business?</td>
<td>Male relative – 86%</td>
</tr>
<tr>
<td>Distance to college</td>
<td>51-100 miles</td>
</tr>
<tr>
<td>First to attend college?</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High School Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algebra</td>
</tr>
<tr>
<td>Geometry</td>
</tr>
<tr>
<td>Pre-Calculus</td>
</tr>
<tr>
<td>Accounting</td>
</tr>
<tr>
<td>Computers</td>
</tr>
<tr>
<td>Personal business/finance</td>
</tr>
<tr>
<td>Economics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COB Majors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Major</td>
</tr>
<tr>
<td>Accounting</td>
</tr>
<tr>
<td>Management</td>
</tr>
<tr>
<td>CIS/ITM</td>
</tr>
<tr>
<td>Economics/Finance</td>
</tr>
<tr>
<td>Law</td>
</tr>
<tr>
<td>Business Education</td>
</tr>
</tbody>
</table>

| 486* |

Note: The total number of majors is greater than 253 because many students indicated interest in more than one major, which is not unusual for entering freshmen who may still be unsure about their chosen majors in COB.
Table 2. Influencing Factors on Major and Career Choice

<table>
<thead>
<tr>
<th>Category of Questions</th>
<th>Influencers</th>
<th>Male</th>
<th>Female</th>
<th>Statistically significant differences between genders?</th>
<th>Hypotheses/Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranking of own abilities</td>
<td>Quantitative abilities</td>
<td>3.79</td>
<td>3.38</td>
<td>yes</td>
<td>Accept H1 and H1a</td>
</tr>
<tr>
<td></td>
<td>Business abilities</td>
<td>4.02</td>
<td>3.62</td>
<td>yes</td>
<td>Accept H1 and H1a</td>
</tr>
<tr>
<td>(1=poor, 2=below average, 3=average, 4=above average, 5=excellent)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influencers</td>
<td>Parents</td>
<td>1.38</td>
<td><strong>1.45</strong></td>
<td>no</td>
<td>Accept H3, Reject H3a</td>
</tr>
<tr>
<td></td>
<td>Teachers</td>
<td>2.91</td>
<td>3.1</td>
<td>no</td>
<td>Reject H3a</td>
</tr>
<tr>
<td></td>
<td>Counselors</td>
<td>3.38</td>
<td>3.4</td>
<td>no</td>
<td>Reject H3a</td>
</tr>
<tr>
<td></td>
<td>Friends</td>
<td>3.68</td>
<td>3.7</td>
<td>no</td>
<td>Reject H3a</td>
</tr>
<tr>
<td></td>
<td>Number of women</td>
<td>5.78</td>
<td></td>
<td></td>
<td>Reject H5</td>
</tr>
<tr>
<td>Ranking of influence on the choice of major</td>
<td>Interest in subject</td>
<td>1.38</td>
<td><strong>1.29</strong></td>
<td>no</td>
<td>Accept H2, Reject H2a</td>
</tr>
<tr>
<td>(1 to 7, where 1=most important and 7=least important; 1 to 8 for female students)</td>
<td>Salary potential</td>
<td>2.56</td>
<td>2.89</td>
<td>yes</td>
<td>Accept H4a</td>
</tr>
<tr>
<td></td>
<td>Job security</td>
<td>3.69</td>
<td>3.42</td>
<td>no</td>
<td>Reject H4a</td>
</tr>
<tr>
<td></td>
<td>Women in business</td>
<td></td>
<td><strong>8.00</strong></td>
<td></td>
<td>Reject H5</td>
</tr>
</tbody>
</table>

Statistically significant differences in bold are from two-sample mean comparisons of means in the unpaired t-test analysis in STATA. The differences between means by gender are tested on two-sample t-test and significance is denoted as “yes” if the result is statistically significant at 1%.
PROJECTION OF THE U.S. BALANCE OF PAYMENTS

Mehdi Hojjat, Neumann University

ABSTRACT

This article uses cross sectional and time series data to forecast the U.S. current account and capital accounts. Both cross sectional and time series projections display a rather robust outlook for the U.S. current account balance. It also reaches to a conclusion that the surplus in the capital account will be shrinking as the U.S. would not need foreign capital to finance its current account deficit. This surplus will be drastically cut in less than 10 years. Both cross sectional and time series projections indicate that U.S. overreliance on foreign capital will be over by 2020 and the U.S. could be in a position to actually finance the deficit of other countries.

Keywords: Current Account, Capital Account, Balance of Payment, Debtor Nation, International Trade, International Economics

1. INTRODUCTION

As generally known, most U.S. economic accounts are in deficit, however, there is a rather large surplus in the U.S. capital account. Why? An understanding of the capital account surplus begins with the balance of payments, the broadest accounting of a nation's international transactions. By definition, the balance of payments always equals zero—that is, what a country buys or gives away in the global market must equal what it sells or receives—because of the exchange nature of trade. People, whether trading across a street or across an ocean, will generally not give up something without receiving something of comparable value in return. The double-entry nature of international bookkeeping means that, for a nation as a whole, the value of what it gives to the rest of the world will be matched by the value of what it receives.

The balance of payments accounts capture two sides of an equation: the current account and the capital and financial accounts. The current account side of the ledger covers the flow of goods, services, investment income, and uncompensated transfers such as foreign aid and remittances across borders by private citizens. Within the current account, the trade balance includes goods and services only, and the merchandise trade balance reflects goods only. On the other side, the capital account includes the buying and selling of investment assets such as real estate, stocks, bonds, and government securities.

The necessary balance between the current account and the capital account implies a direct connection between the current account balance on one hand and the savings and investment balance on the other hand. That relationship is captured in the simple formula:

\[ \text{Savings - Investment} = \text{Total Exports and Receipts} - \text{Total Imports and Payments} \]

Thus, a nation that saves more than it invests, such as China, will export its excess savings in the form of net foreign investment. In other words, it must run a capital account deficit. The money sent abroad as investment will return to the country to purchase exports in excess of what the country imports, creating a corresponding trade surplus. A nation that invests more than it saves—the United States, for example—must import capital from abroad. In other words, it must run a capital account surplus. The imported capital allows the nation's citizens to consume more goods and services than they produce, importing the difference through a current account deficit.

The transmission belt that links the capital and current accounts is the exchange rate. The current account deficit creates a demand for foreign currency to pay for the deficit. Higher demand for foreign currency increases their values in the exchange market, hence, results in depreciation of the value of the home currency.

In this article, we first define capital and capital/financial accounts, and then we examine the most recent data on the U.S. balance of payments accounts. After that, we present our projections for both current and capital accounts.

The current account deficit is an important economic variable showing the level of competitiveness of a
nation. Usually surpluses in a current account are associated with more employment and creation of higher paying jobs. So, it is desirable to have a surplus in this account rather than a deficit. According to the Federal Reserve Bank of New York (2009), the current accounts are divided into the following four sub-accounts.

A. **Merchandise trade** consists of all raw materials and manufactured exported, minus those that are imported. The difference is a *Balance on Merchandise Trade*.

B. **Services** include tourism, transportation, entertainment, engineering and business services, such as law, management consulting and accounting. Fees from overseas amusement parks, such as Euro Disney, patents and copyrights on new technology, software, books, music and movies also are recorded in the service category. The difference between those receipts and payments makes the *Balance on Service*.

C. **Income receipts** include income derived from ownership of assets which are held abroad, such as dividends on holdings of stock and interest on securities. Again, the differences between what we received from foreigners and what we pay them in these categories is called *Balance on Income*.

D. **Unilateral transfers** represent one-way transfers of assets, such as worker remittances from abroad and direct foreign aid. In the case of aid or gifts, a debit is assigned to the capital account of the donor nation. Because of the double entry nature of the BOP accounting, if the U.S. provided gifts or humanitarian assistance, the entry is negative in this sub-account, and it values are entered as a positive number in Merchandise trade as export.

Capital account consists of the following four categories: foreign direct investment (FDI), portfolio investment, other investment, and official reserve account. (Retrieved from http://en.wikipedia.org/wiki/Capital_account - 2014)

A. **Foreign direct investment** (FDI) refers to long term capital investment such as the purchase or construction of machinery, buildings or even whole manufacturing plants. If foreigners are investing in a country, that is an inbound flow and counts as a surplus item on the capital account. If a nation's citizens are investing in foreign countries, that's an outbound flow that will count as a deficit. After the initial investment, any yearly profits not re-invested will flow in the opposite direction, but will be recorded in the current account rather than as capital.

B. **Portfolio investment** refers to the purchase of shares and bonds. It's sometimes grouped together with "other" as short term investment. As with FDI, the income derived from these assets is recorded in the current account; the capital account entry will just be for any buying or selling of the portfolio assets in the international capital markets.

C. **Other investment** includes capital flows into bank accounts or provided as loans. Large short term flows between accounts in different nations are commonly seen when the market is able to take advantage of fluctuations in interest rates and / or the exchange rate between currencies. Sometimes this category can include the reserve account.

D. **Reserve account** is operated by a nation's central bank to buy and sell foreign currencies; it can be a source of large capital flows to counteract those originating from the market. Inbound capital flows (from sales of the account's foreign currency), especially when combined with a current account surplus, can cause a rise in value of a nation's currency, while outbound flows can cause a fall in value (depreciation). If a government (or, if authorized to operate independently in this area, the central bank itself) doesn't consider the market-driven change to its currency value to be in the nation's best interests, it can intervene.

The U.S. current account deficit has been a subject of hot debates between researchers who believed the recent trend in the expanding the deficit will continues and those who believe the deficit gap is narrowing. As Table 1 shows, in 2009 the United States had a deficit in goods of $517 billion but a surplus in services of $138 billion, and Income of $70 billion. Adding Unilateral Transfers to these sums will result in a negative balance of $392 billion.
Therefore, in 2009, the U.S. had a deficit in its Current Account balance. U.S. has never had a surplus in its Current Account in the past 40 years.

Table 1 - The U.S. Balance on Current Account, 2009 (billions of dollars)

<table>
<thead>
<tr>
<th>Balance on Current Account</th>
<th>$000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merchandise Trade Balance</td>
<td>-517</td>
</tr>
<tr>
<td>Balance on Services</td>
<td>+138</td>
</tr>
<tr>
<td>Balance on Income</td>
<td>+ 70</td>
</tr>
<tr>
<td>Balance on Merchandise, Services, and Income</td>
<td>- 309</td>
</tr>
<tr>
<td>Unilateral transfers</td>
<td>- 83</td>
</tr>
<tr>
<td>Balance on Current Account</td>
<td>-392</td>
</tr>
</tbody>
</table>

Source: U.S. Department of Commerce, Bureau of Economic Statistics, estimated based on the first nine month of statistics by the author

Since 2009, U.S. economy has substantially improved. Its current account has also improved and its capital account indicates a growing appetite by foreigners to invest in the United States. However, if the 2009 trend would have continued for a few more years, our worst fears and anxiety would have become a nightmarish reality. The following figure projects the U.S. current account balance if the 2009 crisis would have continued.

Figure 1 – Previous Projection of the U.S. Current Account Balance ($000)

Figure 1 portrays dooms and glooms scenario for the U.S. current account
In the next section we review the literature in this subject, present data set and examine the inflection point on the U.S. current account balance. This inflection point is at the core of this article as it has been missed by previous researchers. By incorporating the inflection point in the data analysis, a robust picture of the U.S. current account balance will be revealed.

2. REVIEW OF LITERATURE
In 1998, Daniel Griswold (1998) from the Cato Institute wrote an article about the U.S. trade deficit. He wrote that article two years after the 1996 Asian financial turmoil. As he was projecting a deeper and deeper deficit for the U.S. current account balance, one of the main points of the article was the following: the U.S. trade deficit has no relationship with the U.S. unemployment rate. This point is still valid. In recent years, we observed inflection points in all trade data that make many of the previous trade analysis erroneous.

In 1989, Howard (1989) who was one of the Directors working for the Governors of the Federal Reserve Bank predicted the recent path of the U.S. current account deficit and the consequent accumulation of external debts create a large, sharp depreciation of the dollar in the future. Others have worried about the implications of the United States as the world's largest "debtor nation," references to the heavily indebted developing countries and the "debt crisis" have been voiced, as have been concerns about the growing foreign control implied by the growth in foreign claims on the United States.

Except for 1990, Americans have run an annual current account deficit with the rest of world in every year since 1982. That unbroken string of deficits has colored much of the trade debate in the United States in the last two decades. Indeed, the deficit was partly to blame for a wave of angst in the late 1980s over so-called American "decline." Best-selling books such as Paul Kennedy's *The Rise and Fall of the Great Powers* and Clyde Prestowitz's (1989) *Trading Places: How We Allowed Japan to Take the Lead* caught the mood of the time. Throughout the 1980s and 1990s, the current account deficit has spawned worry about "unfair" foreign trade barriers, lost jobs, and America's ability to compete in the global marketplace. Kouparitsas (2005) in the Chicago Fed Letter stated that the size of the net export -exports less imports - has to fall by 3% to 3.5 % of GDP to maintain the confidence of foreigners to lend U.S. to finance its current account deficit. But he does not make any comments as how this can be done or if it is practical.

Rafig (2010) examined the time-varying time series processes of the interaction between government fiscal deficits, the current account balance and the real exchange rate for the U.K. and U.S. economies. He concluded that future fiscal deficit reductions alone cannot eliminate U.K. and U.S. current account imbalances. Overall, he expressed a negative view on the U.S. current account calamity. The concern over the growing size of the U.S. current account balance has been the subject of study by several other researchers (Cavallo, M. 2006 and Helbling, T. 2005). The culmination of these researches can be summarized by the work of Cavallo (2006) who related these concerns to the depreciation of the value of U.S. dollar. Indeed, between 2002 and 2004, the dollar declined by about 15% against a broad basket of currencies. She stated that the dollar valuation effects are necessary for smoothing the adjustment process to a more balanced U.S. current account. Unfortunately, Cavallo (November 2006) did not foresee that the U.S. current account imbalance can also be balanced by trade reversal in several categories that are the subject of this article.

During the 2008 recession, the current account deficit disappeared, as trade and financing dried up. However, the factors that caused the deficit – high consumer debt, the U.S. Federal budget deficit and debt, and high savings rates in Japan and China -- still remain. The prediction by Kimberly Amadeo (2012) was that if these factors not addressed, they will eventually limit U.S. economic growth because
she considered the deficit was unsustainable and it the greatest single threat to the global economy.

My assertion is that since the U.S. economy is so large and comparatively stable, it is unlike other countries and can carry the current account deficit without a problem. In March 2014, New York Times (March 14, 2014) reported that big gains in exports and overseas investment income narrowed the United States’ current-account deficit in the fourth quarter to the lowest level in 14 years. The imbalances fell to $81.1 billion in the fourth quarter of 2013, down from $96.4 billion in the previous quarter, according to the U.S. Commerce Department. That was the smallest gap since the third quarter of 1999.

One of the most volatile economic consequences of the global financial crisis was a decline in the U.S. trade deficit in 2009 and a subsequent improvement in the U.S. current account balance. After 2009, creation of new natural gas industry not only significantly reduced the U.S. import of energy products but also created thousands well-paying jobs in this industry. At the same time, a rising demand for U.S. exports to emerging markets such as the BRICK countries (Brazil, Russia, India, China and Korea) means higher demand for the U.S. dollar which maintains its value as the most important reserve currency in the world.

In 2014, five years after the global financial crisis, I broaden Griswold’s research from a mere trade balance to the U.S. current account balance and come up with a very different conclusion. In this article, we will examine recent data on the U.S. current account to see it diverges from the old declining pattern and then we will forecast its future trend.

3. DATA AND METHODOLOGY

3.1 Current Account Data

The U.S. current-account deficit—the combined balances on trade in goods and services, income, and net unilateral current transfers—decreased to $98.9 billion in the second quarter of 2013 from $104.9 billion in the first quarter of 2013. The decrease in the current account deficit was accounted for by a decrease in the deficit on imported goods, an increase in the surplus on income, and an increase in the surplus on services. These changes were partly offset by an increase in net outflows of unilateral current transfers, such as government grants, government pensions and other transfers, and private remittances.

The deficit on goods and services decreased to $117.8 billion in the second quarter from $122.6 billion in the first. The deficit on goods decreased to $175.7 billion in the second quarter from $179.5 billion in the first. Graph 2 shows the trend on the U.S. goods export and import. As shown in this, in the second quarter of 2013 (the latest available quarter as of this writing) goods exports increased to $394.7 billion from $390.7 billion. Exports in four of the six major end-use categories increased. The largest increases were in capital goods and in consumer goods. The increase in capital goods was largely due to an increase in civilian aircraft, engines, and parts. This rising trend of exports has its origin in 2009, after the global financial crisis.
In the second quarter of 2013, goods imports decreased to $570.4 billion from $578.3 billion a year earlier. Increases in five of the six major end-use categories were nearly offset by a substantial decrease in industrial supplies and materials. The largest increase was in automotive vehicles, parts, and engines, much of that in passenger cars. The decrease in industrial supplies and materials was mostly due to a decrease in petroleum and products.

As the U.S. becomes more self-sufficient in the production of oil and natural gas, U.S. imports in this category will decrease. Large oil reserves found by Pioneer Natural Resources Company (stock symbol: PXD) in Texas will make U.S. the largest producer of oil in the world. In November 2013, U.S. production of oil exceeded its imports, and the U.S. became the largest producer of oil and gas in the world.

Thanks to hydraulic fracturing (or fracking) and the ability to drill horizontally, oil and gas production in the U.S. has skyrocketed. [Fracking is a drilling technique that blasts millions of gallons of water and chemicals to fracture rock formations deep beneath the surface and release gas and petroleum.] The production of natural gas by fracking technology has produced an abundance of this energy, to the point that the price of one thermal square foot (TSF) of natural gas in the US is 25 percent of the world price, $3.75 versus $15.

This new trend means that U.S. is no longer an importer of Liquefied Natural Gas (LNG) from such countries as Qatar or Nigeria. Furthermore, the terminals in the U.S. that were built for imports of LNG have been turned into export terminals and within two years the U.S. will become a major exporter of natural gas. Cheniere Energy, Inc (Stock Symbol: LNG) is investing in a LNG plant in Louisiana and other firms are investing in the Chesapeake region of Maryland. The cost of the liquefaction of natural gas is about $3 per TSF, adding an additional $3 for its transportation cost brings the U.S. (FOB) price of exporting natural gas to $9.75, which is well below the current world price of natural gas.

As shown in Figure 3, this new trend in U.S. energy production, import and export is gradually changing the outlook for the U.S. balance on goods and the current account. The data suggest a decrease of 4 percent per quarter or 16 percent annually in imports of petroleum.
percent more of its own energy needs now compared to 2005, according to data from the Energy Information Agency.

Assuming the Department of Energy will issue export permits, by 2015, U.S. will start exporting natural gas from Louisiana, Texas and Maryland LNG terminals. Since 2011, four such projects have been approved. The most recent decision was made in September 2013, when Dominion Resources (stock symbol: D) received approval for the Cove Point terminal on the Maryland shore of the Chesapeake Bay. To date, the DOE has authorized 6.37 billion cubic feet of LNG from the plant to be sold overseas. The expected export of LNG based on $12 per cubic feet, will have a great impact on the U.S. current account balance. Table 2 reports the expected additional export of LNG.

<table>
<thead>
<tr>
<th>Table 2 – U.S. Projected Export of LNG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Annual Export of LNG (billion CF)</td>
</tr>
<tr>
<td>Export Price per Cubic Feet ($12)</td>
</tr>
<tr>
<td>Additional Export of LNG ($b)</td>
</tr>
</tbody>
</table>

Table 2 presents a cross sectional projection of U.S. export of LNG based on the assumptions that the recent trend in LNG production continues and the U.S. government issue export permits.

There are also improvements in the U.S. export of manufactured goods. In December 2013, Automotive News (December 13, 2013) reported about the rebound in the U.S. auto industry. “Saudis driving Ford F-150 pickups and Chinese coveting Jeep SUVs mean more automobiles are filling up ships leaving U.S. ports, boosting revenue for vessel operators and, in turn, helping cut automakers’ per-vehicle shipping costs.” General Motors, Ford, Toyota and BMW are among the firms reporting higher car exports from their U.S. plants to Asian and European countries. In 2013, the United States exported a record 2 million cars and light trucks, and shipments in 2014 are rising over the previous year, according to Commerce Department data (December 18, 2013). Figure 4 shows the recent improvement in the U.S. balance of goods.
Figure 4 – Improvement in the U.S. Trade Balance in Goods

**Improvement in the U.S. Balance in Goods**

<table>
<thead>
<tr>
<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q1</th>
<th>Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td></td>
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<td>2012</td>
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<tr>
<td>2013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Deficit in Goods

*Figure 4 demonstrates a rather sharp improvement in the recent balance of merchandise trade which is the largest category in the U.S. current account. Source of Data: Bureau of Economic Analysis, Release Date: September 19, 2013. Retrieved from Table 2a.*

The surplus in services increased from $56.8 billion in the first quarter of 2013 to $57.9 billion in the second quarter of 2013. As shown in the following graph, this increase has started in 2012.

Figure 5 shows export of service has been more than import of service resulting in a surplus in this category of the U.S. current account. Source of Data: Bureau of Economic Analysis, Release Date: September 19, 2013. Retrieved from Table 3a.

Services exports increased to $169.2 billion from $167.2 billion. Exports increased in five of the seven major services categories. More than half the increase was in other private services, primarily in financial services and in business, professional, and technical services. As shown in Figure 6, the import of services has remained rather flat and has stabilized at around $111 billion. In recent years, the largest increases were in travel categories as more Americans are now financially comfortable and able to travel overseas. With a stable import...
and a rising export of services, the surplus in the service trade has been rising.

**Figure 6 – U.S. Trade in Services ($millions)**

<table>
<thead>
<tr>
<th>2012 Q1</th>
<th>2012 Q2</th>
<th>2012 Q3</th>
<th>2012 Q4</th>
<th>2013 Q1</th>
<th>2013 Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>45000</td>
<td>48000</td>
<td>50000</td>
<td>52000</td>
<td>54000</td>
<td>56000</td>
</tr>
</tbody>
</table>

**Figure 6 shows improvement of the U.S. Balance on Service with a rather strong uptrend line.**

*Source of Data: Bureau of Economic Analysis, Release Date: September 19, 2013. Retrieved from Table 3a.*

The share of service in total exports is also on the rise. As shown in the following graph, the export of services in 1995 was only 26.4% of total export. In 2013, this share grew to 29.5 percent. This trend is expected to continue and will play a critical role in our projection of the U.S. current account balance. Quarterly data suggest a 4 percent increase per year in the export of services and the U.S. balance on service trade, thanks mostly to the U.S. advantages in the internet technology. However, interventionist policies in the sphere of the virtual world, as exposed by Edward Snowden, can create a protectionist policy among even our closest trading allies. This hegemony over service trade has to be respectfully maintained so it does not violate the rights of sovereign nations, including our close trading allies (BEA, September 2013).

**Figure 7 – Share of Goods and Services in U.S. Exports (BEA, 2nd Quarter 2013)**

**Figure 7 demonstrate the share of service as percentage of total export are on the rise, from 22 percent in 1985 to 30 percent in 2013.**


As shown in the following graph, in the second quarter of 2013, the surplus on income increased to $53.1 billion from $50.9 billion in the first.
Figure 8 – U.S. Income Account ($millions)

![U.S. Balance on Income](image)

Figure 8 shows a sustainable surplus on balance of income as both income receipts and income payments are stable. Source of Data: Bureau of Economic Analysis, Release Date: September 19, 2013. Retrieved from Table 4.

In the past several years, income receipts which consist of interest, dividends and direct investment on U.S.-owned assets abroad, have been within a range $190 billion per quarter. Income payments on foreign-owned assets in the United States have also been stable around $135 billion per quarter. Most of the payments in this category are interest payment by the U.S. government on its national debt which is nearing $17 trillion.

Compensation of employees is a small and less volatile category of the U.S. income account. Receipts for compensation to U.S. residents paid by nonresidents are around $1.7 billion per quarter and payments compensation to foreign resident employees paid by U.S. residents are about $3.8 billion per quarter. Net unilateral current transfers to foreigners were $34.2 billion in the second quarter of 2013, up from $33.1 billion in the first. The increase was mostly due to an increase in net outflows of U.S. government pensions and other transfers that resulted from a decrease in fines and penalties received by the U.S. government from foreign corporations. U.S. government grants to foreigners also increased.

As shown in Figure 9, except for 1990, Americans have run an annual current account deficit with the rest of world in every year since 1982. That unbroken string of deficits has colored much of the trade debate in the United States in the last two decades. Indeed, the deficit was partly to blame for a wave of angst in the late 1980s over so-called American "decline." Best-selling books such as Paul Kennedy's The Rise and Fall of the Great Powers (1987) and Clyde Prestowitz's Trading Places: How We Allowed Japan to Take the Lead (1988) caught the mood of the time. Throughout the 1980s and 1990s, the current account deficit has spawned worry about "unfair" foreign trade barriers, lost jobs, and America's ability to compete in the global marketplace. However, as this section will show none of these statements were true.

Beginning in the early 1990s, annual U.S. trade deficits reached unprecedented levels. After deficit reached $800 billion in 2006, and the deficit as a percentage of GDP approached the unprecedented level of 6% (see Figure 10). In the aftermath of the global financial crisis, however, the current account deficit started to shrink. By 2009, the account trade deficit was cut in half, to less than $400 billion, which shattered all doom and gloom projections in this area.
Figure 9 – The U.S. Current Account Balance

Figure 9 shows quarterly data of the U.S. current account balance from 1980 through 2013. The inflection point took place in the last quarter of 2006 and the improvement is continuing.


Figure 10 – The U.S. Current Account Balance as a Percentage of GDP

Figure 10 shown the U.S. current account balance as a percentage of U.S. GDP. Again inflection point happens in 2006 and the improvement is continuing.


3.2 Projection of the Current Account

Researchers have identified a number of macroeconomic variables as indicators of the U.S. export growth. For example, Jun Nie and Lisa Taylor found that U.S. export growth depends on the economic growth in the rest of the world. Not many scholarly papers have examined the effects of growth in the service sector and petroleum production on the U.S. current account. Forecasting the U.S. current account balance in based on the following three assumptions:

- Four percent improvement of trade in service per year
- Increase in the export of LNG as shown in Table 2
- A reduction of 4 percent per year in imports of petroleum products

Using quarterly and annual data, we can make the following projection for the U.S. current account balance.

Figure 11 – Projected U.S. Current Account Balance ($b)
Figure 11 is the projection of the U.S. current account balance based on cross sectional analysis of trade and service accounts of the U.S. balance of payments account. The assumptions include 4 percent increase in the service account, four percent decline on petroleum imports and a gradual increase in LNG exports from Louisiana and Maryland LNG ports. For more information see Hojjat (2014): “Cross Sectional and Time Series Forecast of the U.S. Current Account Balance”

Using time series data we arrive at a similar projection. The following graph (Figure 12) shows the trend line for the current account deficit with the following equation:

\[ Y = 897.26 + 43.86T \]  \hspace{1cm} (1)

<table>
<thead>
<tr>
<th>( t )- statistics</th>
<th>3.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R^2 )</td>
<td>0.5949</td>
</tr>
</tbody>
</table>

Where \( Y \) presents the U.S. current account balance and \( T \) presents the year, \( t \)-statistics is 3.2 which provide 98% confidence interval. Using the above equation, Table 3 projects the projection of the U.S. current account deficit for 2014 through 2020.

![Projected Current Account Based on Time Series](image)

This regression line shows almost 60 percent of the variation in the current account data set is explained by the regression equation. Therefore, the equation has a high predictability power.

As shown in Table 3, this article makes a rather robust projection of the U.S. current account balance and is assets that by 2020, the U.S. will have a slight surplus in that account
Table 3 – Projected U.S. Current Account Balance Using Time Series Data ($b)

<table>
<thead>
<tr>
<th>Year</th>
<th>Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>-193.22</td>
</tr>
<tr>
<td>2015</td>
<td>-149.36</td>
</tr>
<tr>
<td>2016</td>
<td>-105.5</td>
</tr>
<tr>
<td>2017</td>
<td>-61.64</td>
</tr>
<tr>
<td>2018</td>
<td>-17.78</td>
</tr>
<tr>
<td>2019</td>
<td>26.08</td>
</tr>
<tr>
<td>2020</td>
<td>69.94</td>
</tr>
</tbody>
</table>

Table 3 presents the projection of the U.S. current account balance, equilibrium will be achieved by 2018 and for the first time in 4 decades U.S. will have a surplus in the current account balance by 2020.

3.3 Capital Account Data

Foreign Direct Investment - More than 50 percent of net inflows in the financial account are made of foreign direct investment (FDI). The rest consists of changes in the U.S. assets abroad and foreign assets in U.S.A. (both private and official). It also includes currency transfers and net flow of financial derivatives which are very small portion of the financial account. Because of the importance of FDI in creating jobs, improving productivity and fostering economic growth, we examine it first.

As shown in Figure 1, since 2000 both U.S. investment abroad and FDI in the USA are rising. Although U.S. investment abroad increased by 238% between 2000 and 2012, FDI in USA increased by only 111%. Both these trend are indicative of a larger need for U.S. to finance its trade and current account deficit, i.e., the more U.S. investment abroad, the more she needs foreign funds to finance its deficit.
Figure 13 shows a healthy rate of increase in both FDI in USA and also U.S. investment in other counties. 


Fortunately, this trend is changing in recent quarters. In the second quarter of 2013, foreign direct investment (FDI) in the United States was $37.9 billion, up from $28.6 billion in the first. The increase was accounted for by lower net outflows of investment and by larger reinvested earnings than in the first quarter. As shown in the following graph, there is a down-turn trend line in FDI in the USA. As the current account balance in the USA improves, Unites States does not need as much FDI to finance its deficit. At the same time, U.S. is keeping more of her savings at home for investment rather than sending them abroad.

Figure 14 – Foreign Direct Investment in USA (Quarterly Data)

Bureau of Economic Analysis, Retrieved from Table 7a and Table 11a.
This analysis is based on raw data retrieved from Bureau of Economic Analysis: Table 11a. Liabilities to Foreigners, Except Foreign Official Agencies, Reported by U.S. Banks and Securities Brokers /1/ (November 2013)
Currently U.S. has no problem selling its securities abroad. For example, foreign private sales of U.S. Treasury securities exceeded purchases (net sales) by $0.3 billion in the second quarter of 2013, a shift from net purchases of $50.8 billion in the first quarter. The shift to net sales reflected a shift to net sales of U.S. Treasury bills and certificates and a decrease in net purchases of U.S. Treasury bonds and notes.

In other areas the trend is the same. Foreign private sales of U.S. securities other than U.S. Treasury securities exceeded purchases (net sales) by $30.0 billion in the second quarter, up from net sales of $11.0 billion in the first. Net purchases of U.S. corporate bonds were $19.8 billion, down from $32.3 billion. Net sales of U.S. stocks were $29.7 billion, up from $23.4 billion. Net sales of U.S. federally sponsored agency bonds were $20.1 billion, up from $19.8 billion.

All and all, these examples are providing a brighter perspective on the U.S. total indebtedness to foreigners. As of the end of the second quarter of 2013, the total U.S. debt to foreigners was $4.17 trillion. As shown in the following figure, total U.S. debt has been stabilizing around $4 trillion and has a slightly declining trend over the past two years. This figure reports 3.12 percentage cumulative declines in the previous 6 quarters (from the first quarter of 2012 to the second quarter of 2013).

**Figure 15 – Stabilizing U.S. Debt to Foreigners ($ millions)**

![Chart showing stabilizing U.S. debt to foreigners](chart)

**Portfolio Investment** - According to the Bureau of Economic Analysis, net financial inflows were $73.1 billion in the second quarter of 2013, up from $40.4 billion in the first. This is the net balance in the financial account which is mainly consistent of flows of foreign direct investment and U.S./foreign assets. We have already examined the flows of foreign direct investment and now we are going to pay our attention to the flows of assets.

**U.S.-owned assets abroad** - U.S.-owned assets abroad increased $109.6 billion in the second quarter of 2013 after increasing $229.1 billion in the first. U.S. direct investment abroad was $95.5 billion in the second quarter, up from $84.1 billion in the first. The increase was more than accounted for by a shift in equity investment to net outflows in the second quarter from net inflows in the first quarter.

U.S. purchases of foreign securities exceeded sales (net purchases) by $80.1 billion in the second quarter of 2013, down from net purchases of $133.8 billion in the first. Net purchases of foreign bonds were $3.8 billion, down from net purchases of $60.0 billion in the first. Net purchases of foreign stocks were $76.3 billion, up from net purchases of $73.8 billion in the first.

U.S. claims on foreigners reported by U.S. banks and securities brokers decreased $129.0 billion in the second quarter after decreasing $12.6 billion in
the first. Examples of these claims are deposits of U.S. banks at foreign banks and loans by U.S. banks to foreigners.

Foreign-owned assets in the United States - Foreign-owned assets in the United States increased $179.3 billion in the second quarter of 2013 after increasing $265.5 billion in the first.

**Reserve Account** - U.S. official reserve assets decreased $0.2 billion in the second quarter of 2013 after increasing $0.9 billion in the first. The second-quarter decrease reflected a decrease in the U.S. reserve position in the International Monetary Fund. U.S. government assets other than official reserve assets decreased $3.9 billion in the second quarter of 2013 after increasing $0.4 billion in the first. The decrease reflected a reduction of central bank liquidity swaps between the U.S. Federal Reserve System and foreign central banks.

Foreign official assets in the United States decreased $9.7 billion in the second quarter of 2013 after increasing $126.9 billion in the first. The second-quarter decrease was more than accounted for by net sales of U.S. government securities.

The following graph provides the balances on the capital account since 1980. As is shown, U.S. has surpluses in the capital and financial accounts which are the sources of financing of the U.S. current account deficits.

**Figure 16 – Balance in Capital and Financial Accounts Including Reserve Account ($ billions)**

![Graph showing capital and financial accounts](https://example.com/graph)


3.4 **Projection of the Capital Account**

The projection that was presented in the previous section and depicted in Figure 11 can be used to show the relationship between the U.S. current account and capital account. Table 3 also presented the data that projection showing that by 2020, the U.S. will have a slight surplus in that account. As shown in Figure 17, the current account and capital accounts are complementary of each other, without one the other want does not exist, i.e., **Capital Account = Function of Current Account**
The above graph depicts the relationship between current account which is in deficit—the lower line—and the capital account which finances this deficit.

Source of Data; Bureau of Economic Analysis, September 2013.

Given this type of relationship, we can forecast the balances on the capital account into 2020.

Figure 18 – Strong Relationship between the Two Accounts as Expected

Figure 6 displays a regression line for the capital account as an independent variable and current account as independent variable. Since both of these two variables are in the balance of payments accounting, the strong relationship with over 94% R-squared and 21 for t-statistics should not be surprising.
Capital Account = $-25.819 - 3.8239 \text{ (Current Account)} \quad (2)

t-\text{statistics} \quad (-21.96)

\[ R^2 = 0.9421 \]

Using the above equation and forecasted values of the current account, projected values of combined capital and financial accounts are shown below.

**Figure 19 – 2016 through 2010 Forecast for Capital and Financial Account Balance ($ billion)**

Both time series and cross sectional forecast predict a shrinking surplus in the U.S. capital account and that is due to a robust improvement in the U.S. current account.

4. **RESULTS**

Both cross sectional and time series projections display a rather robust outlook for the U.S. current account balance. Both Figure 11 and Table 3 project that by 2020 U.S. will have a current account surplus. The outlook for the U.S. capital account, as shown in Figure 19, displays a shrinking surplus. By 2020, U.S. surplus in that account will disappears as its current account turns positive. These predictions shatter many glooms and doom scenarios about the overreliance of America on Chinese and other foreign capital to finance its deficit. By 2020, U.S. could be in a position to actually finance the deficit of other countries.

5. **CONCLUDING REMARKS**

It was the objective of this article to dissolve the myths that existed regarding the over growing size of the U.S. current account balance and its adverse impact on U.S. economy. The times series and cross sectional projections clearly indicate that we are nearing an inflection point in the projection of the U.S. current account deficit and reducing the surplus in the capital account. In this article we estimated that by 2020, the U.S. will post current account surpluses, thanks mostly to an improvement in the U.S. trade balance. Higher exports, especially the export of energy products and lower imports of energy will make this happen. The current account will also receive a boost from higher surpluses in the service and income accounts. This article also shows that the improvement in the U.S. current account balance has a positive impact on the U.S. capital accounts.

This research can be expanded to include other
balance of payments components including its “statistical discrepancies” which is expanding out of control. It can also be expanded to include foreign policy implications. Would the U.S. become less engaging in the global affairs?

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**Author Profile**

Mehdi Hojjat is a professor of finance and international business earned his Ph.D. from Lehigh University. Hojjat has published a book (*Business Strategy Simulation*) and over 20 articles. He was the founder and Director of International Trade Development Center at Lehigh University and assisted over 200 firms to expand their operations to international markets. He has specialization in international business planning, financial modeling and has organized several international trade missions. He has over fifteen years of experience working with business community and has several years of professional financial experiences.

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ABSTRACT

The purpose of this paper is to review the impacts of changes in energy price on the economy; evaluating gains and challenges with a particular emphasis on changes in energy prices on employment in the U.S. Using Rendon Effect Regression we examined how changes in U.S. oil and natural gas production may affect employment. Our result shows that there is a positive impacts of lowering energy price on employment. Some of the states providing new energy resources are becoming less economically diversified and more economically vulnerable to energy price declines and benefiting more from price increase.

Key terms: Energy price, employment, hydraulic fracturing,

Introduction

U.S. policymakers’ concerns on high price of energy were highlighted in the 1970s when episodes of sharply rising oil prices led to recessions, economic stagnation, and high inflation. However, recent gains in U.S. oil and natural gas production are changing the dialogue about U.S. energy strengths and vulnerabilities. Leaders from both specific markets and regions are looking at the opportunities and challenges associated with the so-called energy production revolution ushered in by the new means to access natural gas and other fuels. Using projected annual growth in U.S natural gas consumption, current U.S reserves of natural gas represent an estimated 70 years’ worth of supply (Brown, 2014). Production and proven reserves of natural gas have increased significantly since the mid-2000s. Prior to the advent of shale gas (is a field in which natural gas accumulated is locked in tiny bubble like pockets within layered sedimentary rock such as shale) in the mid-2000s, total natural gas production in the United States was flat at about 19 trillion cubic feet to 20 trillion cubic feet, however, by 2011 total annual production had grown nearly 30 percent to 24.6 trillion cubic feet (Energy Information Agency, 2011). A continued increase in domestic production could lead to improvement of net exports. The trend in net exports likely depends on the pace of conversion of gas-fired plants, traditional coal-fired power plants and possible conversion of vehicles to natural gas as transportation fuel. According to Energy Information Agency (EIA) net exports of natural gas are expected to grow to 3.6 percent trillion cubic feet in 2040, representing only 12 percent of consumption. The federal government has approved three permits for liquefied natural gas export facilities within the last two years (Brown, 2014).

Another study found different impacts on exports and imports. Imports respond to a change in energy production before exports, as changes in exports require new distributors in foreign countries. If the growth rate of domestic energy production increases by 1 percentage point, the energy import growth rate declines by 1.7 percentage points over the fourth quarter of 2014 and first quarter of 2015, statistically significant effect. Similarly, a 1 percentage point increase in domestic energy production growth leads to a 1 percentage point increase in exports growth over the fourth quarter of 2014 and first quarters of 2015, statistically insignificant effect (Hakkio and Nie, 2014). It is estimated that energy imports are will decline 2.9 percent in 2014 and 4.6 percent in 2015 (Ibid).

Oil at a half price should boost the consumption and spending power of companies and households. This in turn has a positive impacts on global economy as Capital Economics Ltd (Miller, 2015) measured the impacts of crude oil price of $60 and $70 a barrel
that could add 0.5 percent to global GDP in 2014 and 2015. Lower oil price along with lower euro value and low yield should add 1.75 percent to European GDP in 2015.

Indeed, many from potential energy-producing regions are assessing the trade-offs between economic growth associated with expanded gas and oil production and the risks to the environment that this production may pose. The key question is whether this new abundance and accessible natural resources has positive effects on local economic conditions. Greater availability of domestic energy resources benefits the United States by reducing dependence on imported energy and diversifying the economy (Brown and Kennelly, 2013). It is expected that energy exports to increase 12.3 percent in 2014 and 19.4 percent in 2015. The strong growth is supported by both a continued increase in domestic energy production and continued rising foreign demand. Combining the forecasts for imports and exports, net energy imports are expected to narrow by 40 percent, which helps reduce the current trade deficit by about 14 percent (Hakkio and Nie, 2014).

But the boom also brings new vulnerabilities. According to the U.S. Bureau of Labor Statistics, at the height of the early 1980s oil boom, the five industries most sensitive to oil prices—coal mining, oil and gas extraction, oil field machinery, petroleum refining, and petrochemicals—accounted for 1.6 million jobs, 1.8 percent of total U.S. nonagricultural employment. By 2000, the share of these five industries had dwindled to 0.4 percent of total U.S. nonagricultural employment, only 457,000 jobs. With oil and natural gas prices rising beginning in the early 2000s, employment in the oil and natural gas sectors began growing too (Brown and Kennelly, 2013). The boom in production of oil and natural gas from shale formations became a significant factor after 2008. Rising energy prices and the shale boom led to strong growth of U.S. oil and gas employment from 2005 to 2011. Fossil fuel industry has a smaller share of U.S. employment today than it did in the early 1980s, and the industry's share of national economic activity is relatively small. After the end of the recession, between 2010 and the end of 2012, the industry added 169,000 jobs nationwide, growing at a rate about ten times that of overall U.S. employment. The share of oil and gas extraction was 4.3 percent of U.S. GDP in 1981, declined to 0.6 percent by 1999 and rose to 1.6 percent of GDP in 2011 as a result of the shale boom (Ibid).

An energy boom based on shale gas and oil extraction may present opportunities in many different arenas. For instance, some regions will especially benefit from lower consumer prices for home heating and cooling. Similarly, switching to natural gas from diesel in the long-haul trucking industry to take advantage of low natural gas prices may help bring about lower delivery costs for a wide spectrum of household and business goods. Additionally, several parties in regions historically reliant on manufacturing, such as the Midwest, are hoping that low energy prices will bring about new development and jobs in energy-consuming manufacturing sectors, such as chemicals and plastics. Furthermore, greater energy production and chemical manufacturing may lead to more supply chain linkages, which can be developed by regional and local economies (Hansom, Lavelle, Testa, 2013). The long-term local effects from energy development are unknown and complex. According to CBO, shale development will raise GDP in the longer term in two ways: increasing the productivity of existing labor and capital, and increasing the amount of labor and capital in use. CBO estimates that, as a result, real GDP will be 0.7 percent higher in 2020 and 0.9 percent higher in 2040 than it would have been without shale development. Shale oil and gas is no panacea for the long-run issues facing the U.S. economy, and America is in no way on a path to becoming a resource-dependent economy because the U.S. economy is so enormous that no single industry is capable of making a huge difference, not all by itself. Instead, the future of the U.S. economy will need a number of key industries to step up—and it looks as if oil and gas drilling can be one of them.

There are various potential factors and local actors involved with energy development. Market forces, government polices (federal, state, and local), and stocks of local wealth influence energy development, the multiplier effect can become very complex; the owners of land and mineral rights receive energy payments, which in turn affect property values. Thus, payments have a direct effect on income and wealth, both of which influence consumption, savings, and investment.
Preeg findings come as Boston Consulting Group (BCG) - a leading proponent of the idea that U.S. manufacturing will come roaring back -- predicts a surge in U.S. exports, partly helped by lower energy costs and stagnating wages. In addition, BCG says rising exports and "reshoring" of production to the U.S. from China "could create 2.5 million to five million American factory and service jobs associated with increased manufacturing" by 2020 (Hagerty, 2013). Big companies, such as Caterpillar Inc. and General Electric Co., have moved some production back to the U.S. in recent years (Ibid). Some foreign companies, such as tire maker Bridgestone Corp. of Japan, have expanded U.S. capacity, partly to serve customers in the Americas.

With the boom in shale "fracking" and lowers natural-gas and electricity prices in the U.S. along with wages stagnate, "the U.S. is steadily becoming one of the lowest-cost countries for manufacturing in the developed world," the BCG report said (2013). The U.S. will have an edge over rival manufacturing nations in energy costs, along with lower productivity-adjusted labor costs than Germany, Japan, France, Italy and Britain (Ibid). That will allow the U.S. to grab a larger share of global manufacturing sales and the trends are going faster than we thought. A big part of the return of manufacturing jobs to the US has been credited to recent surge in energy production and the historically low price for natural gas. This not only makes energy intensive manufacturing operations in the US more competitive, it also results in lower energy prices for heating homes and fueling transportation.

Tables 1 and 2 representing differences in two decades of oil and natural gas production: As indicated in Table 1, from 1993 to 2012, world oil product has increased by 33 percent. Also, Table 2 presents an increase of 34 percent of world natural gas production since 1993.

Some experts believe oil glut is coming and U.S. is moving toward a significant amount of domestic oversupply of light crude (Gold, 2013). The surge in oil production has been swift, from virtually no output five years ago to one million barrels a day (Ibid). The ramifications could be far reaching, including lower gas online prices for American drivers, rising profits for refineries and growing political pressure on Congress to allow oil exports. But the glut could hurt the very companies that helped create it: independent drillers, who have reversed years of declining U.S. energy production but face lower prices of their products.

Globally, the surge in supply and tumbling prices are attracting notice as OPEC countries could start selling oil to the U.S for less than it would fetch in Asia, the case of price discrimination is very likely due to difference in price elasticity among importing countries. On the other hand, as domestic energy demand grows along with global demand, numbers of oil experts insist that Saudi oil production ( as the main oil producer among the OPEC member countries) has peaked and, indeed, is already in decline. Saudi leverage on the world market has become more limited (Simmons, 2005). Saudi Arabia can try to meet domestic energy demand by investing in solar and nuclear energy. The kingdom has announced plans to build sixteen nuclear reactors at a cost of $ 7 billion each by 2030 (House, 2013). Iran, already staggering under the weight of economic sanctions and years of economic mismanagement, could face even more severe challenges. The country ranks fourth in the world in oil and gas production, and it depends on its energy supplies to project regional influence. But of all OPEC's members, it has the highest fiscal breakeven price: over $150 per barrel. Although it is possible that lower prices might further diminish the legitimacy of the regime and thereby pave the way for more moderate leaders (Blackwill, 2014).

<insert Table 3>

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Experts expect growing production eventually pushes prices of intermediate crude below $50 a barrel, down from $97.38, which will cause more pressure on Congress to loosen crude-oil export restrictions, which dated back to the 1973 OPEC oil embargo. The Energy Policy and Conservation Act of 1975 (EPCA) banned the export of most crude oil in an attempt to insulate the United States from worldwide price shocks. If this ban is lifted as some expect, the recent changes in energy technology may have ever larger effects on energy exports and hence on the GDP growth.

However, U.S relies on alternative source of energy, as indicated in Table 4, it is expected in the future reliance on crude oil will be even less. With technology of horizontal drilling energy producers first drill down and then drill at an angle or even sideways. In this way, more of the reservoir is available and more gas can be recovered. The combination of fracking and horizontal drilling significant structural change has been seen in energy production. Production of natural gas and natural gas liquids reached historical highs in 2013, while petroleum production was about 25 percent below its 1970 historical high and closer to its 1990 level (Hakkio and Nie, 2014). Petroleum production has increased until 1970, then decreased until 2006 and increased through 2013. Natural gas production also had wide swings, where production increased until 1971, decreased until 1986, then increased through 2013. Increase in domestic natural gas production must be absorbed by the market or kept in storage facilities. Thus, flooding the market with natural gas has helped to depress prices. Oil is fungible and traded on a global market, thus domestic oil production is relatively a small share of global oil and can have little effect on price of oil and its prices are determined on a global market (Fitzgerald, 2013).

The debate comes as California lawmakers consider legislation to regulate fracking, which involves pumping water, sand and other materials down wells to break apart rock formations and release oil and natural gas. All these expanded production has often come with environmental costs, which in various places include air pollution, clear cut forests and water tainted by chemicals. The state Conservation Department's Division of Oil, Gas & Geothermal Resources also is trying to create new regulations that would require more disclosure of hydraulic fracturing work in California. Concerns about fracking has risen recently in the state, as oil companies seek to tap the Monterey Shale formation, which the federal government says contains huge oil reserves. But drillers have struggled to get that oil out of the ground, even using horizontal wells and conventional fracking. Offshore, the focus is on activity at the existing 23 oil platforms in federal waters, mostly in the Santa Barbara Channel, where a well explosion in 1969 resulted in one of the largest offshore oil spills in U.S. history. Environmental groups say the state doesn't know enough about fracking onshore or offshore. "There are no specific laws or regulations addressing fracking in either context," (Segee, 2013).

**Review of Literature**

An understanding of the role of energy in economic growth cannot be achieved without first understanding the role of energy in production. The concept of the production function examines the factors that could reduce or strengthen the linkage between energy use and economic activity over time. These key factors are: substitution between energy and other inputs within an existing technology, technological change, shifts in the composition of the energy input, and – shifts in the composition of economic output.

Extensive empirical work has examined the role of energy in the growth process. The principal findings are that energy used per unit of economic output has declined since 1980s, but that this is to a large extent due to a shift in energy use from direct use of fossil fuels such as coal to the use of higher quality fuels, and especially electricity. When this shift in the composition of final energy use is accounted for, energy use and the level of economic activity are found to remain fairly tightly coupled. Furthermore, time series analysis shows that energy and GDP cointegrate and energy use Granger causes GDP growth when additional variables such as energy prices or other production inputs are included. When theory and empirical results are taken into account, the prospects for further large reductions in the
energy intensity of economic activity seem limited. This has important implications for environmental quality and both economic and environmental policy (Stern and Cleveland, 2004).

Natural scientists and some ecological economists have placed a very heavy emphasis on the role of energy and its availability in the economic production and growth processes (e.g. Hall et al., 2001, 2003). In the extreme, energy use rather than output of goods is used as an indicator of the state of economic development (e.g. Kardashev, 1964). Some theories suggest resource abundance may increase local economic development through higher demand for labor in the energy sector and spillover spending in the local economy. Other theories suggest industries not closely related to the resource extraction industry may be harmed as energy product expands. The reason for this could be higher labor demand by the extraction industry may be high enough to push local wages high and pull employees from other lower-paying jobs and make it difficult for other industries to be as profitable—See Table 5 on changes in U.S. average hourly earnings in states with dominant energy sectors. At a national and international level, this phenomenon has been referred to as the “natural resource curse”.

Brown (2014) finds that within the time frame and region he studied, an increase in natural gas production has not been a natural resource curse for local economies. Brown studied labor market conditions at the county level in a nine-state region using econometric models to determine if employment and wage have responded to the rapid expansion of natural gas production from 2001 to 2011. He found a modest positive impact on local labor market outcomes in counties where natural gas production has increased, and little evidence of a natural resource curse. Prior research on resource booms in coal-producing regions reported positive employment and earning effects during extraction and little reversal when extraction declined (Black and others, 2005). Using 2007 data, PriceWaterHouseCoopers estimated that the more than nine million employees, $558 billion in labor income and $1 trillion in total value added by the domestic oil and gas industry, constituted more than 5 percent of US total employment, more than 6 percent of US total labor income and more than 7 percent of US total value added, respectively (Foss, 2014). However, this study did not account for the GDP effects of utilizing oil and gas in energy systems as inputs to other goods and services, nor did include the economic effects of goods manufactured from oil and gas feedstock or economic effects of exporting these goods. In addition contribution to government taxes, royalties, and other fees paid by the oil and gas industry to all government jurisdictions are not considered. All of these benefits would push the total economic value of the US industry into the trillions of dollar and a potential contribution to U.S GDP. The McKinsey Global Institute estimates that by 2020, unconventional oil and gas production could boost the United States annual GDP by between two and four percent, or roughly $380-$690 billion, and create up to 1.7 million new permanent jobs. Furthermore, since energy imports account for roughly half of the more than $720 billion U.S. trade deficit, declining energy imports are already leading to a more favorable U.S. trade balance (Blackwill, 2014).

One study found that in 2011 an estimated 3.4 percent of all farms, roughly 74,000 farms, received lease or royalty payments from energy activities (Weber, et al., 2013). Using nationally-representative data on U.S. farms from 2011, Weber (2013) assessed the consumption, investment, and wealth implications of the $2.3 billion in lease and royalty payments that energy companies paid to farm businesses. They estimated that the savings of current energy payments combined with the effect of payments on land values added $104,000 in wealth for the average recipient farm.

Another study found that counties experiencing a boom in gas production in Colorado, Texas, and Wyoming saw wage and salary income increase by $69 million over the growth period (Weber, 2012). Extraction also generates billions of dollars in payments to landowners and in tax revenues for state and local governments. The long-term implications of gas development on local wealth depend on the industry’s direct effect on local capital (e.g. roads or air quality) and on how workers, landowners, and government use income for development.
Energy prices, economy and employment and opportunities

There has been extensive debate concerning the trend in energy intensity in the developed economies, especially since the two oil price shocks of the 1970s. It is commonly asserted that there has been a decoupling of economic output and resources, which implies that the limits to growth are no longer as restricting as in the past (Stern and Cleveland, 2004).

The Khazzoom-Brookes postulate (Brookes, 1990; Khazzoom, 1980) “rebound effect” and arguing that energy saving innovations can end up causing even more energy to be used as the money saved is spent on other goods and services which themselves require energy in their production. Energy services are demanded by the producer or consumer and are produced using energy itself. An innovation that reduces the amount of energy required to produce a unit of energy services lowers the effective price of energy services. This results in an increase in demand for energy services and therefore for energy (Binswanger, 2001). The lower price of energy also results in an income effect (Lovins, 1988) that increases demand for all goods in the economy and therefore for the energy required to produce them. There may also be adjustments in capital stocks that result in an even further increased long-run demand response for energy (Howarth, 1997). This adjustment in capital stocks is termed a "macro-economic feedback". Howarth (1997) argues persuasively that the rebound effect is less than the initial innovation induced reduction in energy use, so improvements in energy efficiency do, in fact, reduce total energy demand.

Regional perspectives are different; Partridge (2013) argued that new horizontal drilling technologies appears to be having positive net effects initially, and large economic benefits on jobs. However, the energy sector is one of the most capital-intensive, causing higher productivity in the economy; therefore, it does not typically employ large numbers of people on as sustainable basis (Ibid). Regarding another regional consideration, Pennsylvania and Ohio recently gained thousands of jobs associated with shale formation development. But as a percentage of total employment, the net effect has been small. Typically, local job effects drop off after the period of well development in the locality, and the employment effects tend to be longest lived where the corporate offices of development companies are located. Brown (2014) finds that within the time frame (2001-2011) and region (nine-state region in the central United States) under consideration, an increase in natural gas production has not been a natural resource curse for local economies. So far, local employment and wage effects have been positive, but modest.

In our study it shows that in some states wage effects have been much stronger than others- Louisiana, North Dakota, West Virginia, and Wyoming had the highest percentage of increase in hourly wage from 2007-2012, see Table 5. North Dakota’s fossil fuel industry has grown rapidly since the onset of the shale boom and extraction is now 4 percent of state employment. West Virginia, with a strong coal industry, benefited from higher oil prices and higher demand for labor that affected the hourly wage rate. We can observe different changes in average hourly from 2012-2013 despite the fact that economy was recovering and national jobless rate was declining. For example in Louisiana there was a decrease in average hourly earnings by 11.09 percent from 2012-2013 and in North Dakota a decline of 24.7 percent.

Three general approaches have been used to estimate the employment impacts of energy price changes: large scale macroeconomic models of the economy (Wharton and D.R.I. model), estimation of the elasticities of factor substitution and factor demand in a production function framework (Brendl and Wood, 1975) and regional growth models (Huntington and Kahn, 1977). A macro-model that estimates sectoral and occupational employment effects has been developed by Early and Mahtadi (1976) where they used the B.L.S. input-output model to obtain employment forecasts for 129 sectors and 470 occupations in 1985. They produced employment estimates for ten major sectors and nine occupational categories. The most relevant finding was that manufacturing employment declined by about 1 percent with increase in imported oil price to $16 per barrel compared to a reference price of $13 per barrel. Berndt and Wood (1975) used four
factor translog cost function for U.S manufacturing for the 1947-1971 period. They found labor and energy to be substitutes, implying that a rise in the energy price relative to wages will increase employment. Their estimated cross price elasticities of labor with respect to the price of energy are -0.3. Hudson and Jorgenson (1974) used the same methodology finding cross price elasticities of -0.04. The Griffin-Gregory (1976) study employs the same four factor translog cost function approach (holding output constant) and applied it to the manufacturing sector on the nine industrial nations. They too found that labor and energy are substitutes and they estimated cross price elasticities to be 0.08 to 0.15. Deschenes (2010) notes that higher industrial energy costs may affect labor demand; he uses 30 years of data to estimate a cross-price elasticity of -0.15 to -0.08, implying that the proposed bill's 3 percent increase in electricity prices might result in 0.3 percent less employment in the short run. These models capture the effects of changes in the composition of final demand, and do not reflect the substitution among factor inputs that may result from changing relative factor price. Solnick (1980) developed a model captured the limitations of the other models discussed by taking into consideration the substitution of other inputs for energy as its relative price rises, or the impact of higher energy prices on the level of output and employment. Furthermore, he evaluated the potential impacts of price changes of oil on employment in 1980s. He found the negative relationship between employment change and energy price change, holding output constant.

Brown and Yücel (1995) estimated the pattern of impacts of oil price on employment in different periods; 1992 and then 2000. In 1992, 10 percent higher oil prices reduced employment by 1.86 percent in Delaware and increased employment by 0.95 percent in Oklahoma and 1.40 percent in Wyoming. By 2000, the same increase is projected to yield extremes of -1.54 percent in Delaware, 0.58 percent in Oklahoma, and 0.94 percent in Wyoming. They found the employment-weighted variance of the response across states to be 0.0749 in 1992 and 0.0360 in 2000. Brown and Hill (1988) estimated the long-run oil price elasticities of employment in each key industry. They found elasticities of +1.01 for oil and gas extraction, +1.23 for oil field machinery, +0.45 for coal extraction, -0.56 for petroleum refining, and -0.32 for petrochemicals.

**Methodology**

Because the United States is an oil importer, its economy has been hurt by previous episodes of sharply rising oil prices that resulted from oil supply shocks (Kilian, 2009). Not all economies are affected to oil price shocks, studies shows that the economies of forty-two states and the District of Columbia would suffer if oil prices rise. In contrast, the economies of eight states—Alaska, Louisiana, New Mexico, North Dakota, Oklahoma, Texas, West Virginia, and Wyoming—would benefit from such increases (Brown, 2013). In this study, we measured the pattern of impacts of changes in oil price on the above eight states on unemployment rate for 15 years (120 data observations), 1999-2014. The major sources of employment data came from the Bureau of Labor Statistics, U.S. Department of Labor and United States Census Bureau and data for price of oil came from U.S Energy Information Administration (EIA). Random Effect Regression is applicable in the context of panel data that is data comprising observation of two or more “units” or “groups” in two or more time periods. The choice between fixed effects and random effect expressed as tradeoff between robustness and efficiency. Random effect estimation ignoring the intergroup variation that is why it has been chosen.

We used Random-Effects GLS and found out the oil price elasticity of employment for these states is +0.268, which means for every 10 percent decrease in price of oil, on average employment increases by 2.68 percent—see Table 6.

<insert Table 6>

Other studies estimated the impacts of changes in price of energy on employment in different states. Several states with larger fossil fuel industries see positive effects or a smaller negative effect than the country as a whole. Combined, these eight states would add around a hundred thousand jobs in response to a 25 percent rise in oil prices (Brown, 2013). Wyoming would benefit most from an oil price spike because it has a small population and a large share of oil and gas extraction employment.
Alaska's economy has traditionally depended on the oil extraction industry, has the second highest share of extraction employment among all states, and remains a beneficiary of higher oil prices. North Dakota's fossil fuel industry has grown rapidly since the onset of the shale boom and extraction is now 4 percent of state employment. West Virginia, with a strong coal industry, benefits from higher oil prices, but by less than what we previously estimated in 1995 for 1982 and 1992 (Brown, 2013).

The employment effects of various energy price have been previously studied in 1970s when price of oil was increasing and U.S. was more dependent on imported oil compared to today. In 1982, the states with the greatest concentration of energy-related industries were West Virginia, Wyoming, Delaware, Oklahoma, Louisiana, and Texas (Brown and Yücel, 1995). Rising oil and gas prices since the early 2000s prompted a resurgence of energy employment. Oil and natural gas accounted for much of the activity except in Delaware, which had a high concentration of the petrochemical industry, and in West Virginia, the heart of coal country. Shares of energy-related employment ranged from 7.3 percent in Texas to 13.7 percent in West Virginia. By 2000, these shares had declined to a range from 2.5 percent to 7.4 percent (Brown, 2013). Increased use of horizontal drilling and hydraulic fracturing led to further gains in oil and gas hiring. As of 2011, the states with the highest shares of energy employment were Alaska, Louisiana, New Mexico, North Dakota, Oklahoma, Texas, West Virginia, and Wyoming. Energy employment shares increased in all eight of these states from 2000 to 2011. Between 2006 and 2012, while U.S. employment declined 0.05 percent per year on average, employment in North Dakota and Texas grew by 3.4 and 1.5 percent, respectively, the fastest growth in the country (Brown, 2013).

Challenges and Policy Implications

While many are concerned about the long-term damage to our environment, we need to continue the use of carbon-based fuels until greener energy sources are competitive economically. U.S economy is based on cheap and easy energy and U.S. cannot meet its current needs without carbon-based energy—See Table 4 on U.S. Energy Consumptions. Any programs that would increase taxes on current energy sources (carbon tax) will raise energy costs. In addition to inflicting damage on the economy, rising fuel and energy prices would be an additional burden on a middle class that has seen their incomes fall in the last decade. Technological advances are required not only to make green energy more cost competitive, but also to build capacity for green energy. A consistent, gradual shift to greener fuels is among the best option to greener energy sources without inflicting severe economic damage on a still struggling economy. The Environmental Protection Agency (EPA) in March 2014 issued long-awaited rules to cut the sulfur content of gasoline by 67 percent in 2017, and to reduce tailpipe emissions in cars and pickups starting in the 2017 model year. The EPA said the rules were developed with input from oil producers and refiners, as well as vehicle makers and environmental groups, and would bring about significant reductions in pollution at a low cost. The auto industry and environmental and health-advocacy groups hailed the new rules, called Tier 3 standards, saying they would help reduce smog and save lives by reducing lung disease. In addition, the rules would tighten emissions standards for cars made for model year 2017 and beyond, reducing pollutants such as nitrogen oxides and volatile organic compounds. Cars made before that will emit less pollution once they start using the new gasoline in 2017. The reduction in ground-level smog could save America $19 billion a year in health-related costs by 2030 (Mundy, 2014).

If we are to move to greener energy sources, we also need to redesign the infrastructure for distributing power in the US. The current model is to generate electricity at central power plants and to distribute that power to remote customers. With the introduction of roof-mounted solar panels and wind turbines, technology was also developed to sell excess energy back to grid. We need to build on this model and start planning now to change from centrally generated and distributed electricity to electricity generated at millions of points and fed into a grid.

As we have learned from the Deepwater Horizon oil spill, just because we have the technology to extract oil and gas from new sources does not mean that we can do it safely. As the price of oil has risen and
technology has advanced, we are now able to extract oil and gas from areas that were previously inaccessible. New sources of oil and gas from shale formations in the US and tar sands in Canada require more energy resources to extract and result in both direct and indirect pollution. Extraction of oil from tar sands requires the generation of large amounts of steam and uses solvents to process and help transport the oil. Hydraulic fracturing to extract oil and gas from shale formations requires the injection of large amounts of fresh water along with chemicals into wells to break up the shale and release the gas and oil. Accessing this energy requires tens of thousands of new wells, each fracked with enough water to fill several Olympic swimming pools and hundreds of gallons of chemicals. It also requires turning whole countries into industrial zone, compete with fleets of trucks, air quality concerns, a disruption of nature, and fear that water aquifers will be poisoned (Gold, 2014). The waste water from this process is contaminated and is considered hazardous waste; much of it is injected into dry wells. Fracking has also been associated with well water contamination. In rural areas, fracking competes with agriculture for fresh water. The rapid pace of unconventional gas extraction has raised concerns about potential effect on the environment and their varied associated costs in different parts of the country. The environmental debate mostly has centered on water quality. Poorly cemented wells can leak and contaminate groundwater, as has been documented in Colorado, Ohio and Pennsylvania (Lustgarten, 2009a). Flowback water not recaptured by drilling companies can contaminate surface water, as occurred in Dimrock, Pennsylvania (Lustgarten, 2009b). But captured water requires treatment to remove dissolved solids. In areas with insufficient wastewater facilities, one disposal method has been to pump the water back underground. This approach, however, has been blamed for causing earthquakes (Fischetti, 2012).

As fossil fuels become more difficult and dangerous to extract, transport, and process, we will likely see more disruptions in supply of oil and gas. We already see price spikes when hurricanes shut down oil rigs in the Gulf of Mexico. Drilling for oil in remote areas above the arctic circle will be subject to winter storms and impacted by the presence (and absence) of sea ice. As global demand for energy rises, we will continue to search for more sources of energy in more remote and inhospitable areas of the globe, prices will become more volatile and interruptions to supply will become more frequent. There are other reasons as well. From Saudi Arabia, Iran to Mexico, in Europe and Africa oil and gas belong to the state. State-run energy companies, in many parts of the world, administer and exploit these national resources. The governments usually own all the oil and gas, even if they are under private property. The United States chose a different path; American colonists rejected English common law, which reserved all minerals rights for the monarch. Initially, landowners in the United States owned their minerals and this created an enormous incentive for them to allow oil and gas drilling. A permissive legal system, large financial incentives for the owners of mineral rights to allow drilling, and a tradition of small, independent energy companies struggling for survival and willing to take risks created an environment where fracking took root and flourished. From 1982 to 2008 fracking industry reached an annual production of 1.84 trillion cubic feet of natural gas from shale. It took years to double that to 3.68 trillion cubic feet. And it took less than two years to double that again to 7.36 trillion cubic feet (Gold, 2014). So, fracking is here and it will stay, what began in Texas moved to neighboring states and then across the country. It is now spreading around the world. Fed by steady capital from investors, the drilling industry created a glut of gas and reserved decades of declining oil production. The energy industry wasn’t prepared, and neither were landowners and government officials. While fracking created new wealth, jobs and economic opportunities, it also had its own set of problems.

The best way for the US to secure its economic future is to move from a net importer of energy to a net exporter of energy and/or energy technology. To save the environment for the next generation, U.S. need to base its economy on non-polluting, renewable sources of energy. If U.S. can develop and implement alternative means of supplying the energy needed for domestic economy, it will be in a position to be the Middle East of the renewable/green energy economy. If we choose to continue to chase fossil fuels at the expense of greener energy supply, we will continue to be at the mercy of others for our energy and economic
Conclusion

Over the past two decades, two new technologies—hydraulic fracturing and horizontal drilling—brought significant change to the energy sector. As a result of higher production and hence changes in energy prices have had sizable but different effects on economic activity across states. The American energy revolution does not just have commercial implications; it also has wide-reaching geopolitical consequences. Global energy trade maps are already being redrawn as U.S. imports continue to decline and exporters find new markets. Most West African oil, for example, now flows to Asia rather than to the United States. And as U.S. production continues to increase, it will put downward pressure on global oil and gas prices, thereby diminishing the geopolitical leverage that some energy suppliers have wielded for decades. Most energy-producing states that lack diversified economies, such as Russia and the Gulf monarchies, will lose out, whereas energy consumers, such as China, India, and other Asian states, stand to gain. Lower energy prices will be a particular boon for China and India, which are already major importers and which, according to the International Energy Agency, will see their demand for oil imports grow by 40 percent (for China) and 55 percent (for India) from 2012 to 2035. As the two countries import more energy from the Middle East and Africa, they will take ever-greater interest in these regions (Blackwill, 2014).

New technologies for accessing energy resources, changes in global energy markets, and government policies at all levels have influenced energy development in the 2000s. Local wealth endowments—particularly of natural resources, but also of human, physical, and other types of capital—have affected where development has occurred. Energy development in turn has affected local wealth endowments by creating income, jobs and government revenue that can be invested locally or by affecting natural amenities or social capital. Energy-producing regions have tended to favor policies that would boost domestic energy prices, while energy-consuming regions have tended to favor policies that would lower domestic energy prices.

Economic impacts of development in domestic energy production brings about excitement about the prospects for future growth and development not only for the United States, but also globally. At the same time, it raises important questions for further empirical research on plunging investment in energy industry and more consumption at lower price with greater contribution to the global warming.

At the same time, U.S. policymakers will need to make sure they protect the sources of the country's energy wealth. Even though private-sector players have driven nearly all the advances that unleashed the boom, their success has depended on a supportive legal and regulatory environment. Leaders at both the state and the federal levels will have to strike the right balance between, on the one hand, addressing legitimate concerns over the environmental and other risks associated with fracking and, on the other hand, securing the economic benefits of production.

Likewise, leaders in the U.S. energy sector should work with public authorities to establish standards of transparency, environmental protection, and safety that can help build public confidence and address the risks of developing shale resources (Blackwill, 2014). And the country as a whole will have to update and expand its energy infrastructure to fully harness developments in unconventional oil and gas—a transformation that will require substantial investments in building and modifying pipelines, railroads, barges, and export terminals.
Table 1: Top Oil Producers
Total Supply, in million barrels a day

<table>
<thead>
<tr>
<th></th>
<th>1993</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>67.1</td>
<td>89.3</td>
</tr>
<tr>
<td>U.S.</td>
<td>9.6</td>
<td>11.7</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>8.9</td>
<td>11.1</td>
</tr>
<tr>
<td>Russia</td>
<td>7.0</td>
<td>10.4</td>
</tr>
<tr>
<td>Iran</td>
<td>3.6</td>
<td>4.4</td>
</tr>
<tr>
<td>Mexico</td>
<td>3.1</td>
<td>3.9</td>
</tr>
<tr>
<td>China</td>
<td>2.9</td>
<td>3.6</td>
</tr>
<tr>
<td>Venezuela</td>
<td>2.6</td>
<td>3.2</td>
</tr>
<tr>
<td>Norway</td>
<td>2.4</td>
<td>3.0</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>2.3</td>
<td>2.9</td>
</tr>
<tr>
<td>Canada</td>
<td>2.3</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Price of oil $18.43
Price of oil (spot price) $94.05


Table 2: Top Natural Gas Producers
Dry natural gas output, in trillion cubic feet

<table>
<thead>
<tr>
<th></th>
<th>1993</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>76.51</td>
<td>115.99</td>
</tr>
<tr>
<td>Russia</td>
<td>21.81</td>
<td>22.90</td>
</tr>
<tr>
<td>U.S.</td>
<td>18.10</td>
<td>22.21</td>
</tr>
<tr>
<td>Canada</td>
<td>4.91</td>
<td>5.36</td>
</tr>
<tr>
<td>Netherlands</td>
<td>3.11</td>
<td>5.22</td>
</tr>
<tr>
<td>U.K.</td>
<td>2.31</td>
<td>4.71</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>2.29</td>
<td>3.63</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1.97</td>
<td>3.58</td>
</tr>
<tr>
<td>Algeria</td>
<td>1.90</td>
<td>3.26</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>1.59</td>
<td>2.92</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>1.27</td>
<td>2.85</td>
</tr>
</tbody>
</table>


Table 3: Average Prices of Selected Fuels and Electricity: 1990 to 2010

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>1990</th>
<th>2000</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Oil, Composite</td>
<td>Barrel</td>
<td>$22.22</td>
<td>28.26</td>
<td>28.53</td>
<td>36.98</td>
<td>50.24</td>
<td>60.24</td>
<td>67.94</td>
<td>94.78</td>
<td>59.29</td>
<td>76.69</td>
</tr>
<tr>
<td>Motor gasoline:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unleaded Regular</td>
<td>Gallon</td>
<td>1.16</td>
<td>1.51</td>
<td>1.59</td>
<td>1.88</td>
<td>2.30</td>
<td>2.59</td>
<td>2.80</td>
<td>3.27</td>
<td>2.35</td>
<td>2.7</td>
</tr>
<tr>
<td>No.2 Heating Oil</td>
<td>Gallon</td>
<td>0.73</td>
<td>0.93</td>
<td>0.93</td>
<td>1.17</td>
<td>1.71</td>
<td>1.98</td>
<td>2.24</td>
<td>2.99</td>
<td>1.96</td>
<td>2.46</td>
</tr>
<tr>
<td>No.2-Diesel Fuels</td>
<td>Gallon</td>
<td>0.73</td>
<td>0.94</td>
<td>0.94</td>
<td>1.24</td>
<td>1.79</td>
<td>2.10</td>
<td>2.27</td>
<td>3.15</td>
<td>1.83</td>
<td>2.31</td>
</tr>
<tr>
<td>Residential Fuel Oil</td>
<td>Gallon</td>
<td>0.44</td>
<td>0.60</td>
<td>0.70</td>
<td>0.74</td>
<td>1.05</td>
<td>1.22</td>
<td>1.37</td>
<td>1.96</td>
<td>1.34</td>
<td>1.71</td>
</tr>
<tr>
<td>Natural Gas, Residential</td>
<td>1000 cu/ft</td>
<td>5.80</td>
<td>7.76</td>
<td>9.63</td>
<td>10.75</td>
<td>12.70</td>
<td>13.73</td>
<td>13.08</td>
<td>13.89</td>
<td>12.14</td>
<td>11.20</td>
</tr>
<tr>
<td>Electricity, Residential</td>
<td>KWh</td>
<td>7.83</td>
<td>8.24</td>
<td>8.72</td>
<td>8.95</td>
<td>9.45</td>
<td>10.40</td>
<td>10.65</td>
<td>11.26</td>
<td>11.51</td>
<td>11.58</td>
</tr>
</tbody>
</table>

See also http://www.eia.gov/totalenergy/data/monthly/
Note: Crude oil is refiner acquisition cost and unleaded gas is average, all service.
Table 4: U.S. Energy Consumption, 2015 and World Energy Production, 2015, Billion BTU’s

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>World Energy Production</th>
<th>U.S Energy Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Oil</td>
<td>30,804,324</td>
<td>6,134,315</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>22,093,028</td>
<td>4,804,273</td>
</tr>
<tr>
<td>Coal</td>
<td>29,360,173</td>
<td>3,244,231</td>
</tr>
<tr>
<td>Nuclear</td>
<td>7,558,478</td>
<td>1,483,266</td>
</tr>
<tr>
<td>Biomass</td>
<td>1,471,695</td>
<td>827,567</td>
</tr>
<tr>
<td>Hydroelectric</td>
<td>5,741,979</td>
<td>459,440</td>
</tr>
<tr>
<td>Biofuels</td>
<td>678,163</td>
<td>367,229</td>
</tr>
<tr>
<td>Wind</td>
<td>1,061,745</td>
<td>286,144</td>
</tr>
<tr>
<td>Solar</td>
<td>577,881</td>
<td>39,649</td>
</tr>
<tr>
<td>Geothermal</td>
<td>238,432</td>
<td>55,070</td>
</tr>
</tbody>
</table>

Source: [www.usdebtclock.org/energy.html](http://www.usdebtclock.org/energy.html), Retrieved on March 6, 2015

Table 5: Average Hourly Earnings of All Employees on Total Private Payrolls, by State

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>24.7</td>
<td>25.01</td>
<td>24.8</td>
<td>23.9</td>
<td>24.51</td>
<td>25.58</td>
<td>25.53</td>
<td>3.65</td>
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<tr>
<td>New Mexico</td>
<td>18.57</td>
<td>18.73</td>
<td>18.92</td>
<td>19.57</td>
<td>19.7</td>
<td>19.82</td>
<td>19.94</td>
<td>6.73</td>
</tr>
<tr>
<td>N. Dakota</td>
<td>18.34</td>
<td>18.76</td>
<td>19.21</td>
<td>20.19</td>
<td>21.45</td>
<td>22.77</td>
<td>17.14</td>
<td>24.15</td>
</tr>
<tr>
<td>W. Virginia</td>
<td>17.04</td>
<td>17.71</td>
<td>18.09</td>
<td>18.65</td>
<td>18.94</td>
<td>19.58</td>
<td>18.05</td>
<td>14.91</td>
</tr>
<tr>
<td>Wyoming</td>
<td>20.04</td>
<td>20.83</td>
<td>21.06</td>
<td>21.45</td>
<td>22.18</td>
<td>22.38</td>
<td>21.05</td>
<td>11.68</td>
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</tbody>
</table>

Random-effects GLS regression
Number of obs = 120
Group variable: state_id
Number of groups = 8

R-sq: within = 0.0000
between = 0.0000
overall = 0.2602

Obs per group: min = 15
avg = 15.0
max = 15

corr(u_i, X) = 0 (assumed)
Wald chi2(1) = 41.50
Prob > chi2 = 0.0000

| Variable     | Coef.   | Std. Err. | z     | P>|z|   | [95% Conf. Interval] |
|--------------|---------|-----------|-------|-------|---------------------|
| lnoil        | 0.268   | 0.042     | 6.44  | 0.000 | 0.187    to   0.350 |
| cons         | 0.706   | 0.163     | 4.34  | 0.000 | 0.387    to   1.025 |
| sigma_u      | 0       |           |       |       |         |
| sigma_e      | 0.283   |           |       |       | 0       |
| rho          | 0       |           |       |       | 0       |

Table 6: Dependent variable: Unemployment [Random Effect GLS Regression]

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>intercept</td>
<td>0.706</td>
<td>4.34</td>
</tr>
<tr>
<td>ln oil</td>
<td>0.268</td>
<td>6.44</td>
</tr>
<tr>
<td>Wald Chi_square</td>
<td>41.50</td>
<td></td>
</tr>
</tbody>
</table>

References


Brown, S. P.A. “The Shale Gas and Tight Oil Boom:


SYSTEMIC RISK OF LARGE U.S. BANK HOLDING COMPANIES WITH REGIME SWITCHING IN TAILS

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ABSTRACT

This paper is stress testing large U.S. bank holding companies (BHCs) subject to regime shifts in tails. Transition probabilities of switching regimes in conditional Value-at-Risk are inferred by the Markov-Switching Quantile Autoregression approach recently developed by Liu (2014). This Markov-Switching Conditional Value-at-Risk (MSCoVaR) is suitable to Supervisory Stress Scenario required by Federal Reserve Bank in Comprehensive Capital Analysis and Review, since it is capable of identifying separate sets of parameters for each risk regime in which systemic risks are characterized and tested. In addition, this proposed method also provides great flexibility to stress-testing a variety of hypothetically distress scenarios. Using the CoVaR approach of Adrian and Brunnermeier (2011) as the benchmark model, this paper finds that the CoVaR approach underestimates systemic risk contributions of individual BHCs by around 131 basis points of asset loss on average. Furthermore, this paper constructs Bank Systemic Risk Index by value-weighted individual risk contributions.

INTRODUCTION

Recently, Adrian and Brunnermeier (2011) propose to measure systemic risk via the conditional value-at-risk (CoVaR) of financial system as a whole, conditional on institutions being in a state of distress. In their work, an institution’s contribution to systemic risk is defined as the difference between CoVaR conditional on the institution being in distress and CoVaR in the median (“normal”) state of the institution. Hence, it characterizes the marginal contribution of a particular institution (in a non-causal sense) to the overall systemic risk.

The CoVaR approach is particularly appealing in that it outlines a method to construct a countercyclical, forward-looking systemic risk measure by predicting future systemic risk using current institutional characteristics. This is a time-varying systemic risk measure which does not rely on contemporaneous price movements and thus can be used to anticipate systemic risk. This method relates systemic risk measure to macroeconomic variables and the balance sheet deleveraging and characteristics of individual institutions. This is essentially a main regulatory concern of central banks.

However, Bisias et al. (2012) raise the important econometric issue of nonstationarity which is particularly relevant to systemic risk measurement. Virtually the existing methods of systemic risk estimation and inference rely on the assumption of stationarity. In other words, the joint distribution of the relevant variables is stable over time. Nonetheless, the literature has recognized the stylized fact of structural breaks in macroeconomic and financial time series, so that the distribution structures of a time series might, driven by economic states, evolve over time. Hence, the very nature of systemic risk implies a certain degree of nonstationarity that may not always be consistent with the econometric framework in which risk measures are typically estimated.

The goal of this paper is to measure systemic risks subject to regime shifts for stress-testing large U.S. bank holding companies (BHCs). In this paper, assuming that regimes follow a discrete, latent first-order Markov process, the transition probability matrix of switching regimes in conditional Value-at-Risk is inferred and filtered by using the Markov-Switching Quantile Autoregression (MSQAR)
approach. The MSQAR model framework, recently developed by Liu and Luger (2015), is the location-scale quantile autoregression in which the location and scale parameters are permitted to evolve over time. Hence, this Markov-Switching Conditional Value-at-Risk (MSCoVaR) can measure an institution's risk contribution to financial system by evolving joint distributions over time.

In this paper, I estimates MSCoVaR and simulates MSCoES as the measure of risk contributions of large U.S. BHCs. The empirical results show strong evidence for the existence of regime shifts in lower tails. The new systemic risk measures show in comparison that the CoVaR approach of Adrian and Brunnermeier (2011) underestimates systemic risk contributions of individual banks by around 131 basis points of asset loss on average. The empirical results also present that the banking system is more sensitive to marginal changes of an individual bank during high risk episodes than during normal risk periods. In addition, Banking Systemic Risk Index appears to have a high relevance in tracing financial distress situations over the sample period.

Daily market equity data were taken from The Center for Research in Security Prices (CRSP). The universe of bank holding companies (BHCs) are the stocks corresponding to CRSP SIC codes 6000-6199 and 6712. Daily market data is used to form weekly returns on market-valued total assets of individual banks. Following Adrian and Brunnermeier (2011), a bank market-valued total asset is transformed from book-valued total assets into market-valued total assets by applying market-to-book equity ratios. Then, the financial system return is computed as a value-weighted average on the returns of the universe of banks. See details in Adrian and Brunnermeier (2011) and Lopez-Espinosa et al. (2012). Note that the universe of financial institutions with the SIC code of 6000-6199 and 6712 is used to construct asset returns of banking system as a whole.

The figure below plots the quarterly systemic risk index of the banking sector (BSRI). The solid line is the quarterly Financial Stress Index constructed by Federal Reserve Bank of St. Louis (STLFSI). The dashed line is quarterly BSRI constructed by the value-weighted MSCoVaR on individual banks.

The figure shows that the constructed BSRI is capable of reproducing the recent economic recession. The quarterly BSRI reaches the highest risk during the recent financial crisis of 2007-2009. The BSRI also shows a mild risk increase for the economic recession during the IT Bubble Bust period since it is not a recession highly related to the banking sector. Figure 1 presents a positive 61.5% co-movement between the BSRI and the STLFSI. Furthermore, a simple linear regression shows that the BSRI is able to significantly explain the dynamics of the Financial Stress Index by 37.83% (R-square). Hence, the constructed BSRI index is supplementary to monitoring financial market risks by very specific to the risk nature of the banking sector.

REFERENCES


THE FEDERAL RESERVE, CRONY CAPITALISM AND THE GROWTH OF INEQUALITY

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Grove City, PA 16127

ABSTRACT
Many economists have expressed concern about recent trends of rising inequality and stagnating real incomes of the middle class and poor. This article will focus on the role of Federal Reserve monetary policy and the associated growth of crony capitalist policies in contributing to rising inequality and slow growth of the incomes of middle class Americans since the 1970s. Beginning with a discussion of the historical relationship between growth of the financial sector, inequality and stagnant wages, the paper uses Austrian business cycle theory to explain how policy affects asset values and the distribution of income and wealth. This theoretical framework is used to help explain changes in economic growth rates and inequality before, during and after the 2008 financial crisis.

INTRODUCTION
During most of the period from 1979 to the present wages of the middle class have been growing more slowly than productivity. Inequality has been increasing as demonstrated by the fact that incomes of the top one percent have risen much faster than inflation since 1979. Stagnant wages of the middle class and the rising incomes of some of the wealthiest Americans, particularly finance professionals, are not just the result of free market forces, but reflect the growth of crony capitalism [1] stemming from the unstable international fiat money system that we have had since the gold-dollar standard ended in 1971.

Much of the increasing inequality between 1979 and 2007 can be explained as the result of technological change and globalization, which increased rewards to those who are more talented [2]. This increase in inequality arguably plays an important role in motivating people to acquire skills and in motivating the talented to produce more of the goods and services that people value highly. Although some would argue for trade restrictions, higher minimum wages, and progressive income taxes to reduce inequality, the potential for interfering with economic growth and reducing employment suggests caution about pursuing interventions designed to reduce the inequality that results from market forces.

On the other hand, hidden in the data on increases in inequality in the economy as a whole is more detailed data suggesting that some of the increase in inequality does not reflect market forces. Asking the question of who makes up the wealthiest Americans and how the composition of the top one percent has changed suggests that something else is going on. In particular, considerable evidence supports the assertion that growth in the number of people employed in the financial sector and rising incomes of financial professionals can be at least partly blamed on changes in policy, particularly Federal Reserve policy. Rather than contributing to economic growth, policy-induced changes in the financial sector have interfered with efficient resource allocation, as evidenced by the recent financial crisis.

This article is concerned primarily with inequality that is not the result of market forces, but of government policy and Federal Reserve Policy, particularly monetary policy. Because of monetary policy, government regulation of housing and financial markets, government guarantees and bailouts, outcomes in terms of who gets what share of the benefits of economic growth differ from the outcome that would result in a free market economy governed by the rule of law. In a free market economy institutions and policy are designed to maintain a level playing field and not to benefit any particular group. By contrast, Federal Reserve monetary policy, the regulation of banks and financial institutions, and bailouts have benefitted particular groups at the expense of others. Because of their redistributive effects, policies chosen are often the result of rent seeking. Rent seeking has influenced legislation, executive branch pressure on Federal Reserve monetary policy, and the policies of regulatory agencies. Much of this rent seeking has benefitted the wealthiest Americans at the expense of everyone else.

GROWTH OF THE FINANCE SECTOR, RISING INEQUALITY, AND ECONOMIC STAGNATION:
THE HISTORICAL RECORD

Much has been written to explain growth of the incomes of the top one percent relative to everyone else. Evidence for the assertion that part of this growth reflects policy-induced distortions in the economy includes changes in who is included in the top one percent. The largest groups in the top one percent are...
executives, managers and supervisors of nonfinancial corporations, followed by medical professionals, and then financial professionals (Bakija, et al., 2012). The number of financial and real estate professionals in the top one percent has grown faster than numbers for any other group (table 1).

Kaplan and Rauh (2010) demonstrate that among the top 0.1%, it is finance professionals and lawyers who have seen the biggest increases in income, with both their numbers and incomes rising substantially between 1994 and 2004. They provide evidence that the higher pay for financial professionals results from the larger amounts of money that they manage now compared to in the past.

The finance share of profits in the US economy rose from 15% in 1980 to 45 percent in 2002 (Lin and Tomoskovic-Devy, 2013). At its peak in 2006, output of the financial services sector constituted 8.3 percent of US GDP. This compares to 4.9 percent in 1980 and 2.8 percent in 1950 (Greenwood, et al., 2013). Not only has the finance sector grown, but the nonfinancial sector has become financialized. Between the late 1970s and 2000, financial income, consisting of dividends, interest, and capital gains became an increasing share of the incomes of nonfinancial firms compared to income from the sale of goods and services (Lin & Tomoskovic-Devy, 2013). This is especially true among manufacturing firms.

The question is whether the growth in the financial services sector after 1980 was beneficial or not. The US already had a vibrant financial sector at that time, which played an important role in allocating capital so as to facilitate rapid economic growth. Between 1980 and 2007, the parts of finance that experienced the most growth were asset management and credit intermediation (Greenwood, et al., 2013). Growth of asset management likely benefitted young firms by reducing the cost of capital. In theory, more resources devoted to active asset management could lead to better use of information to monitor management’s stewardship of firm resources. Some resources spent on active asset management, such as expenditures that enable some investors to profit at the expense of less informed market participants, however, are socially wasteful. The possibility that the net benefits of increased spending on active asset management were negative is suggested by the “two large and socially costly valuation errors” experienced between 1995 and 2008- the internet bubble and the overvaluation of mortgage-backed securities (Greenwood, et al., 2013).

The growth of credit intermediation might appear to provide net benefits for society in the form of lower cost access to credit. This expansion generated considerable social costs, however, in the form of excessive household leverage and a more fragile financial system (Greenwood, et al., 2013). As explained below, the problem was that the price of credit on the margin was too low to reflect time preference or the risk of default, resulting in too much growth of credit intermediation.

The Problem of Secular Stagnation- Wall Street Thrives while Main Street Languishes

Between 1982 and 1999 the stock market, as measured by the S & P 500 index, rose in real terms by an average of more than 12 percent per year (Crotty, 2003). Median real wages, by contrast, grew slowly during this period. Except for a brief period during the late 1990s, since 1979, wages have been rising more slowly than productivity (Gordon, 2014). While the middle class experienced slow wage growth, the rich benefitted from the booming stock market.

Financial professionals and wealthy investors again prospered between 2001 and 2007, while average workers did not do so well. Median wages grew very slowly and job growth did not keep up with population growth, unlike the preceding 47 years, when job growth averaged 1.6 percent per year (Stockman, 2015).

By some measures, the economy did relatively well between 1979 and 2007, with output per hour growing at about a 2 percent annual rate in the private business sector (Dew-Becker and Gordon, 2005). This apparent steady moderate growth masked underlying problems, problems that were the result of inflationary monetary policy and growing debt. During the century prior to 1980, total public and private debt rarely exceeded 1.6 times GDP; by 2008, total US debt outstanding was 3.6 times GDP (Stockman, 2013 p. 4).

Growing distortions in the economy, while masked by outward signs of prosperity, ultimately led to the financial crisis of 2008. Besides the growing inequality and stagnant wages since 1979, the great recession revealed the extent of the distortions in the economy, which had been growing for decades.

The Great Recession and Aftermath

In the years leading up to the great recession, investment banks and government sponsored enterprises (GSEs) securitized several trillion dollars of mortgage debt (Friedman, et al., 2011 p. 13). Much of this mortgage debt was owed by borrowers who were not creditworthy and many of the loans exceeded 90% of the assessed value of the houses. About two thirds of outstanding mortgage bonds were guaranteed by Fannie
Between 2001 and 2007, commercial banks added billions of dollars of agency mortgage backed securities and "private label" mortgage backed securities to their balance sheets (Friedman, et al., 2011 p. 13). A big reason for this is that regulators considered mortgage loans and mortgage backed securities to be lower risk assets. Regulators permitted banks to hold a lower percentage of capital for mortgage backed securities than for mortgage loans and less for mortgage loans than business loans (Friedman, et al., 2011 p. 63).

In response to events during the 2008 financial crisis, particularly the insolvency of investment banks, some large money center banks, and the GSEs, the Federal Reserve purchased trillions of dollars of mortgage backed securities and Congress passed the Troubled Asset Relief Program (TARP), which provided $700 billion from the treasury to assist financial institutions. Because of bailouts, the largest and most politically powerful financial firms did not lose very much from the great recession. For example, Goldman Sachs received $10 billion of TARP money in 2008 and then generated a financial surplus of $29 billion in 2009 (Stockman, 2013 p. 3).

The biggest share of TARP money went to AIG, an insurance company that got heavily involved in selling Credit Default Swaps (CDS) that were intended to protect the balance sheets of some large money center banks and investment banks. The purpose of the $180 billion bailout of AIG was not to protect those insured by AIG, but to preserve the value of the assets of the world’s largest financial institutions who bought CDSs from AIG, such as Goldman Sachs, Societe General, Deutsch Bank, Bank of America and Barclays (Stockman, 2013 p. 7). If AIG had gone bankrupt it would not have affected many ordinary Americans. Those insured by AIG would not have lost anything because its insurance subsidiaries had high quality assets, which were legally protected from claims against its CDS liabilities.

As will be explained below, monetary policy and associated government bailouts did little to correct the distortions in the economy that were responsible for the financial crisis and the great recession. The next section describes the process by which Federal Reserve Policy and associated changes in financial markets contributed to rising inequality and economic stagnation and ultimately led to the financial crisis of 2008 and the great recession.
financial assets but had a smaller effect on the prices of goods and services. Financial professionals and their clients, borrowing the newly created money, bought those assets before their prices rose very much, benefitting at the expense of those who purchased the assets later at much higher prices.

Since 1987, Federal Reserve monetary policy appears to have been consistent with the political interests of finance professionals. Rather than letting interest rates adjust to reflect market conditions, the Federal Reserve pursued a policy of monetary gradualism in the late 1990s and early 2000s, reducing interest rates or raising interest rates slowly even as debt was increasing and inflation rates were rising (Kauffman, 2009 pp. 186-87; Taylor, 2009 p. 3). This approach, when market conditions would have led to faster interest rates increases, contributed to asset price bubbles. Market determined interest rates rise in response to excessive borrowing, thereby discouraging further borrowing that would push asset prices to unsustainable levels. The Federal Reserve kept interest rates from rising as much as they would have in a free market. Monetary gradualism, as it was pursued between the late 1990s and 2006, played an important role in contributing to the stock market boom of the late 1990s and the housing boom that followed.

Financial crises weed out financial institutions that take too much risk, but swift intervention by the Federal Reserve kept losses from the various crises to a minimum, enabling risky financial institutions to survive while encouraging more risk taking in the future. Intervention by the government or the Federal Reserve resolved the Savings and Loan Crisis, the stock market crash of 1987, the developing country debt crisis, the bankruptcy of long term capital management, the Enron fiasco and the Dot-Com collapse, among others (Wray, 2012). Intervention during the 2008 financial crisis followed the same pattern.

In many cases, the method used to resolve each crisis reduced the losses to those whose capital or credit was at risk, and these were often wealthy investors. The Federal Reserve played an important role in intervening before losses were too great, using the so-called “Greenspan Put”, which was an implicit commitment that the Fed would adjust interest rates if assets prices started falling too far or too fast [3]. Greenspan signaled his willingness to support asset prices in the action he took to sharply reduce interest rates in the aftermath of the 1987 stock market crash and in the liquidity crunch of 1998. Miller, Weller, & Zhang (2002) suggest that his tendency to pursue one-sided interventions increased market participants’ faith in Mr. Greenspan’s ability to stabilize the stock market, thereby reducing the observed risk premium on stocks. The result was to encourage excessive risk-taking.

A number of sociologists, such as Lin and Tomoskovic-Devy (2013) have written about the financialization of the US economy. Financialization has altered the dynamics of the US economy. Much of twentieth century economic growth can be attributed to firms pursuing process and product innovation over the long term to the benefit of major stakeholders. In recent years, however the relationship between financial markets and nonfinancial corporations (NFCs) has changed. Management has come to see the NFC as a portfolio of liquid subunits to be restructured continually in order to maximize the stock price (Crotty, 2003). Instead of the pay of management being linked to the long term success of the firm, it has been linked to short term stock price movements.

Federal Reserve monetary policy combined with lower tax rates on capital gains gave firms incentives to use “financial engineering” methods, such as stock buybacks to push their share prices higher (Stockman, 2013). Paying out more cash, whether as share buybacks or dividends, reduces the amount that can be reinvested in the business, thus limiting productivity growth and job creation, which would have benefitted workers.

In theory, the price of a long-lived asset should reflect the expected future earnings from that asset. For a variety of reasons, recent high stock prices did not necessarily reflect firms long term prospects. Stock price increases in many companies were the result of financial agents extracting cash flow in the form of dividends and stock buybacks (Crotty, 2003). Stock buybacks were sometimes used to offset the increase in outstanding shares due to the granting of stock options to executives. The quest for short term stock price appreciation worked against the pursuit of long term investment, particularly investment in skill formation, which is the key to sustainable economic growth.

If monetary policy were stable, changes in the price of a company’s stock would be largely the result of changes in expected future earnings. Expansionary monetary policy, however, distorts the signals provided by market prices. This is evidenced by the bumpy, event driven rises in stock prices during the 1990s and prior to 2008, which were reflected in “75 percent” merger and acquisition “takeover premiums, corporate announcements of giant stock buyback programs” and sporadic large short-term price gains among growth stocks (Stockman, 485). Prices were not determined by underlying fundamentals but by financial professionals watching each other’s actions and trying to forecast.
Federal Reserve policy and its consequences. The prices of nearly all stocks rose in the 1990s and between 2002 and 2007, regardless of how well managed the company was. Quite a few of the firms that experienced outsized speculative gains in their share prices during the late 1990s or early 2000s saw their prices later plummet.

Policy beginning in the Greenspan era fostered the growth of hedge funds, private equity firms, and highly leveraged real estate partnerships that “flourished around and about Wall Street” (Stockman, 2013 p. 485). Hedge funds use leverage to make speculative bets on currencies and other financial instruments. The growth of hedge funds, many of which failed during the financial crisis, can be partly blamed on the Federal Reserve’s orchestration of the bailout of Long Term Capital Management (LTCM), a large hedge fund, in 1998. Although no government financing was provided for this bailout, the Federal Reserve kept interest rates low and used its authority to persuade Wall Street dealers to provide $3.5 billion in emergency loans, which were critical to the survival of LTCM (Longman, et al., 1998).

The Fed’s role in this bailout made clear that if it determined that a firm’s failure imperiled system wide financial stability, the firm would be bailed out, regardless of “how odious its behavior might have been” (Stockman, 2013 p. 15). The LTCM bailout signaled to Wall Street that such speculation could continue to enrich a few while the risks would be offset by Federal Reserve Policy or private bailouts supported by the Federal Reserve.

All of these changes in financial markets created opportunities for financial professionals to earn higher and higher incomes. Many, particular those in the banking sector, did not bear the full risk associated with their actions. Hedge fund managers were partially shielded from risk by their hope of a bailout similar to that received by LTCM or by the crisis driven manipulation of interest rates referred to as the Greenspan “put”. Their incomes exploded after 2000. In 2002, it took $30 million to make it to the top twenty-five hedge fund manager incomes; in 2004, it took $100 million (Hacker, et al., 2010). Likewise, in the two years before the financial crisis, Goldman Sachs, Merrill Lynch, Morgan Stanley, Lehman and Bear Stearns paid their employees bonuses of $75 billion (Hacker, et al., 2010)

Much of the growth in the finance sector has been associated with the growth of large, complex financial institutions. The structure of financial institutions changed after 1980, as deregulation opened the door for commercial banks to expand the size and scope of their operations [4]. The increased systemic risk that accompanied the growth of these institutions has imposed negative externalities on the larger economy (Bivens and Mishel, 2013). These external costs became evident in the 2008 financial crisis.

It is doubtful whether the growth of the largest commercial banks benefitted the economy. Haldane (2010) cites evidence that economies of scale in banking are exhausted at levels of assets not much larger than $10 billion. Concentration of the banking system permitted rising incomes for the managers of the largest banks, but it also made those institutions difficult to manage. It was not that senior managers recklessly pursued risk, but rather that those senior managers did not exercise effective oversight over frontline traders, who came to rely on ever more complex mathematical models to guide their decisions (Davies, 2010, 215). The combined market capitalization of the top ten banks rose from $500 billion to $1.25 trillion between 2000 and 2007, but the market cap of the six that survived the financial crisis had fallen to $250 billion by March 2009 (Stockman, 2013 p. 403).

Causes of the Financial Crisis

The blame for the financial crisis belongs to regulations and Federal Reserve monetary policy that distorted the market signals that influenced the decisions of bank executives, investment bankers and hedge fund managers. Low interest rates resulting from expansionary monetary policy increased the profitability of leveraged bets on financial assets. These leveraged bets in turn fueled investment, especially investment in housing. Without expansionary Federal Reserve monetary policy and the resulting low interest rates, people would have been much less inclined to borrow to buy houses or to refinance their homes, increasing their debt in the process.

In a market economy with no expansionary monetary policy, interest rates equilibrate savings and investment. People save more if they plan to buy more goods in the future and fewer goods in the present. More investment projects funded from increased savings enable businesses to produce more goods in the future to satisfy future demands of savers.

Expansionary monetary policy results in an increased supply of credit without a corresponding increase in savings. The result will be that more funds will be directed to long term investment projects but there will not be a corresponding increase in future demand for the additional output resulting from the increased
investment in these projects. This was manifested by a boom in housing investment, which was unsustainable, because households in the aggregate did not have enough wealth to sustain the payments on new and existing homes, which they would have had if the investment had been funded out of savings rather than credit expansion.

The low interest rates caused by expansionary monetary policy cause an increase in demand for income earning assets, but the choice of assets depends on other factors. The fact that a large share of the mal-investment between 2001 and 2008 ended up in housing is the result of regulation- particularly regulation that was designed to limit risk taking by banks, but also regulation of financial ratings agencies. The decision of which assets to include in their portfolios was influenced by capital adequacy regulations, which banks had to satisfy. These regulations were risk based- if banks held assets that regulators deemed to be less risky, such as mortgage backed securities, they could take on more leverage. Regulators permitted banks to reduce their ratio of capital to assets by holding AAA or AA-rated mortgaged backed securities (Friedman, et al., 2011). Many of the underlying mortgages were actually subprime mortgages, since ratings did not apply to specific mortgages but to a portion of the value of a pool of mortgages. Mortgage backed securities were sliced and diced into tranches, based on payment priority [5].

It is important to emphasize that the conventional wisdom that the financial crisis was caused by banks taking too much risk in the pursuit of high yields does not hold up well under scrutiny. A better explanation is that it was the system of bank regulation, especially capital adequacy requirements associated with Basel II, which resulted in banks taking too much risk. Banks relied on rating agencies, which gave mortgage backed securities AAA ratings even when they did not deserve it. The combination of capital adequacy standards, mistakes by rating agencies and mark-to-market accounting rules played an important role in causing the problems experienced by money center banks and investment banks leading up to the 2008 financial crisis (Friedman and Kraus, 106-107)

Because mortgage backed securities enabled banks to take on more leverage or maintain a larger capital cushion with existing leverage, the demand for those securities increased. As interest rates started to rise after the summer of 2004, demand for prime mortgages declined. In order to maintain loan origination volume, lenders expanded the definition of acceptable credit. The result was that in 2005 and 2006, over a third of mortgage originations were in the subprime and alternative-A categories, meaning that the borrowers had not satisfied the criteria to qualify for a conforming mortgage (McIntyre, et al., 2010).

One of the reasons why banks held so many securities backed by subprime and alt-A mortgages was because of the failure of the ratings agencies to accurately assess the risks of those securities. This in turn can be blamed on how those agencies were regulated. Since 1975, regulations protected Moody’s, Standard and Poor, and Fitch from competition by giving them the exclusive right to rate securities for firms regulated by the SEC (Friedman, et al., 2011 p. 22). Regulations specifying the ratings of securities that various kinds of firms were allowed to hold effectively made these three ratings agencies unofficial arms of the US government (Friedman, 13). This little oligopoly did not have to worry about new competitors taking their market share if their ratings turned out to be inaccurate. Their inaccuracy became evident as the percentage of mortgages, particularly subprime loans, which experienced missed payments grew beginning in 2007, as reported by the Mortgage Bankers Association (Kolb, 2011 p. 59).

Housing was not the only asset whose price was driven up by Federal Reserve expansionary monetary policy. Stock and bond prices also were bid up because low interest rates reduced the cost of borrowing short and lending long and of companies borrowing to finance stock buybacks and takeovers.

Federal Reserve policy was fueled by political pressure, particularly from investors and financial institutions who suffered the consequences of the dot-com crash in 2001. Rock bottom interest rates resulting from the Fed’s response to the dot-com crash fueled the housing boom by making it easier to refinance mortgages, even among borrowers who might not otherwise have been able to make their payments. This in turn emboldened mortgage brokers and other financial institutions selling mortgages with low or no down payments to borrowers with low incomes or poor credit histories. Steadily rising housing prices sustained this process, since a borrower who had difficulty making monthly payments could pay off his mortgage by selling the house to someone else for more than what he paid.

Investors, financial institutions, and home buyers who were the first to access the newly created credit profited the most, particularly if they sold before asset prices collapsed in 2007 and later. Median wages rose relatively slowly as spending and household demand was concentrated in booming sectors of the economy such as housing. Homebuilders, which were in the business of reselling houses and land also did well.
during this period.

The distortions in the economy caused by inflationary monetary policy ultimately bore negative consequences for those invested in real and financial assets as real estate prices collapsed along with stock prices. Asset price bubbles ultimately pop and in a free market economy, financial discipline is restored when speculators who bet too much on the continued rise of asset prices lose their shirts. For example, the crash drastically reduced the prices of Goldman and Morgan Stanley equity and bonds that had been inflated partly because investors underestimated the risk associated with funding long term assets with inexpensive short term borrowing (Stockman, 2013 p. 25).

Although many wealthy investors lost millions during the financial crisis, they were able to recoup much of their lost wealth in the stock market boom that followed the financial crisis, beginning in 2009. Many of those in the middle class and below did not recover as quickly from the financial setbacks of the great recession. Quite a number lost their jobs and many had their wages cut even if they kept their jobs or found new ones. Also, it became harder for the average investor to earn a decent return on savings due to the Federal Reserve reducing short term interest rates to zero following the financial crisis.

As noted above, along with inflationary Federal Reserve monetary policy, a variety of developments in financial markets and the banking system contributed to rising income inequality and led to the 2008 financial crisis. An understanding of the transmission of monetary policy offers a general explanation of the impact of more than 30 years of inflationary policy. Inflation motivates households to borrow to purchase assets. Higher income households are able to borrow a larger percentage of their income and obtain more favorable loan terms than lower income households (Hulsmann, 2014). Thus in an inflationary economy, the distribution of wealth tends to become more and more unequal over time and the gap between wealth and incomes increases. Evidence for this can be seen in the growth in the ratio of mean to median net worth between 1969 and 2010.

RESPONDING TO OBJECTIONS

Those who embrace a Keynesian model of macroeconomic policy might object to the assertion that Federal Reserve policy is ultimately responsible for the economic distortions and their consequences as described in this article. An alternative view is that we need to return to the regulation of the financial sector that contributed to stability between the 1930s and 1980. This includes reinstating those parts of the Glass-Steagall Act that prevented investment banks from being affiliated with commercial banks. Yet, regulation, particularly bank capital regulation played an important role in contributing to the financial crisis, as explained above.

Proponents of the Keynesian model view the discretionary monetary policy of the Federal Reserve as necessary for maintaining economic stability and for preventing another Great Depression. The fatal flaw of the Keynesian approach is its focus on short run relationships between policy and economic outcomes. This justifies responding to recessions with expansionary monetary policy and bailouts. Such a policy regime is easily coopted by politically powerful interest groups seeking to profit by policy-induced appreciation in the prices of real or financial assets. Thus we get a rapid expansion of the money supply as a response to large declines in the stock market, regardless of whether such policy is warranted to offset cyclical declines in the rate of economic expansion.

Without central bank intervention, the process of recovery from a financial crisis redistributes income and wealth from debtors and those who made high risk loans to savers and creditors who hold high quality securities. Intervention by the federal government and Federal Reserve, however, sought to preserve the wealth of politically powerful financial professionals by providing bailouts and massive expansion of the monetary base in response to the 2008 financial crisis. These bailouts, although defended as saving the financial system from collapse, had the primary effect of preserving the wealth of investment bankers and individuals invested in firms that took excessive risk and would otherwise have gone bankrupt. As market participants observed widespread bailouts of large firms deemed too big to fail, they have been encouraged to take more risks in expectation that bailouts will be offered on similar terms in the future.

Politicians seeking bailouts sought to convince the public that without bailouts businesses would not be able to obtain the credit necessary to pay their workers and ATMs would go dark. It was the money center banks, not the Main Street Banks that had accumulated toxic assets and faced a risk of insolvency. Unlike the money center banks, the vast majority of assets on ordinary commercial banks’ balance sheets were high quality loans, including $2 trillion of residential mortgages most of which were of prime credit quality (Stockman, 2013 p. 30). In spite of myths to the contrary, bank credit, lending to nonfinancial businesses and interbank lending had not declined when TARP was being considered as a response to the financial crisis in September of 2008 (Chari, et al.,

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Another argument was that the commercial paper market, an important source of working capital would have seized up apart from bailouts. Money market funds, especially those that invested in commercial paper, did experience redemption pressure in September 2008, following the decline in value of Reserve Primary Fund’s shares from one dollar to 97 cents. To prevent further disruption of the commercial paper market, the government sought to discourage further redemptions, by guaranteeing the value of money market funds for a period of time, beginning in September 2008 through the Treasury’s Temporary Guarantee Program for Money Market Mutual Funds (Dwyer, et al., 2009). Unlike TARP, these guarantees did not involve a large potential cost to taxpayers, even under the worst case scenario. Evidence provided by the Minneapolis Federal Reserve Bank raises questions about whether even this kind of intervention was needed, since the quantity of commercial paper issued by nonfinancial corporations had not declined and the interest rate paid by those with an AA rating had not increased (Chari, et al., 2008).

CONCLUSION

Although rising inequality can be blamed on a variety of factors, Federal Reserve monetary policy, and deregulation of the financial sector played an important role. The growing wealth of a small minority of investors and financial service professionals, resulting from policy-induced distortions, does not trickle down. Rather, such distortions prevent capital from being allocated to its most productive purposes, limiting the growth of the economy as a whole. Policies that focus on redistributing income between groups, whether progressive taxes, stronger unions, or minimum wages are not the solution to the inequality discussed in this article. Without more fundamental changes in our monetary system, we cannot expect a return to the steadily growing and relatively stable economy we had during the 1950s and 60s, an economy that benefited almost everyone who was willing to work hard and learn the skills needed for success.

End Notes

1 “Crony capitalism” is really not capitalism at all. It looks like capitalism in that it involves firms and individuals investing in capital in pursuit of a profit, but rather than being market determined, the rewards are influenced by government subsidies, bailouts and regulation that favors those with the right connections.
2 Globalization increased the relative demand for resources which were more abundant in the US, such as skilled labor, while technological change resulted in replacing unskilled labor with computerized methods of production that used more skilled labor.
3 Bernanke used a similar approach in response to the 2008 financial crisis.
4 The problem with bank deregulation is that it is only partial. Because of government guaranteed deposit insurance and expectations of bailouts for the largest banks, banks are not responsible for one of the most important harmful consequences of taking too much risk. Research suggests that banks with over $100 billion of assets receive an implicit subsidy, which averages over $34 billion per year for the largest US banks (Haldane, 2010). If bank deregulation occurred in a free market context without deposit insurance or implicit commitments to bail out large banks if they fail, it would not have so many adverse incentive effects.
5 A given pool of mortgages was contractually structured into various tranches according to the principle of subordination (Friedman, et al., 2011 pp. 19-20). Differences in risk did not signify different types of mortgages. Subordination means that payment would first flow to a senior tranche of mortgage backed securities. After all triple-A bondholders had been paid, AA+ bonds received revenue and so on down to the lowest rated-tranche. Each tranche was entitled to a certain share of the revenue from payments on the pool of mortgages. At the bottom, having the lowest priority of receiving payment, was an equity tranche retained by the sponsoring bank. Loss from defaults was first absorbed by the holder of the equity tranche, but if large enough the loss could spread to higher rated bonds.

REFERENCES


Table 1. Percentage of primary taxpayers in the top one percent of the distribution of income (excluding capital gains) that are in each occupation.

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<tr>
<td>Executives, managers, supervisors (non-finance)</td>
<td>36.0%</td>
<td>33.6%</td>
<td>34.5%</td>
<td>34.1%</td>
<td>31.6%</td>
<td>31.3%</td>
<td>30.3%</td>
<td>30.4%</td>
<td>31.0%</td>
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<tr>
<td>Medical</td>
<td>16.8%</td>
<td>20.4%</td>
<td>17.9%</td>
<td>15.1%</td>
<td>16.5%</td>
<td>17.2%</td>
<td>17.7%</td>
<td>16.7%</td>
<td>15.7%</td>
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<td>Fin. professionals, including management</td>
<td>7.7%</td>
<td>10.6%</td>
<td>11.9%</td>
<td>13.1%</td>
<td>13.5%</td>
<td>13.2%</td>
<td>13.1%</td>
<td>13.6%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Lawyers</td>
<td>7.0%</td>
<td>8.9%</td>
<td>7.7%</td>
<td>7.3%</td>
<td>8.3%</td>
<td>8.5%</td>
<td>8.9%</td>
<td>8.8%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Other</td>
<td>32.5%</td>
<td>26.5%</td>
<td>28.0%</td>
<td>30.4%</td>
<td>30.1%</td>
<td>29.8%</td>
<td>30.0%</td>
<td>30.5%</td>
<td>31.0%</td>
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Figure 1. M2 Growth (less small time deposits)

THE INFLUENCE OF MOTIVATIONAL FACTORS ON BUSINESS PROFESSORS' INCLINATIONS TO RETIRE

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ABSTRACT

This paper is a proposal for a study of motivational factors that may affect business professors’ choices of whether or not to retire. The study will address whether inclination to retire is affected by factors related to motivation and satisfaction, such as those described by Maslow’s Hierarchy of Needs (Maslow, 1943; Maslow, 1954) and Herzberg’s Motivator-Hygiene Theory (Herzberg, Mausner, and Snyderman, 1959). Factors will include economic factors such as perceptions of whether or not a professor’s assets are sufficient to retire, as well as social factors associated with a professor’s work, and factors related to professors’ sense of satisfaction and achievement from work. Data will be collected through a questionnaire survey to be completed by business professors approaching retirement age. The results may have the potential to provide insight regarding projections of future professor retirements.

INTRODUCTION

Anticipating business faculty hiring needs entails consideration of a number of factors that affect the supply and demand for business faculty. Factors that affect demand may include the number of high school graduates, the proportion of high school graduates who attend college, the proportion of college students that major in business and other factors that affect enrollment. Factors that affect the supply of business faculty include the number of business Ph.D. graduates, as well as the number of business professors who retire. This paper addresses factors that may affect business professors’ retirement decisions. A question to address is how differences between predicted and actual business faculty retirements might affect future Ph.D. graduates ability to find academic positions.

Some studies suggest that if retirements of business faculty were to exceed the number of new Ph.D. graduates, a faculty shortage may arise. For example, in an article about accounting faculty, Ruff, Thibodeau and Bedard, (2009) report that, as of 2009, an analysis by the AICPA (American Institute of Certified Public Accountants) and the American Accounting Association suggests that between 500 and 700 accounting faculty are expected to retire each year, while the average number of accounting Ph.D. graduates is approximately 140 per year. It is suggested that the accounting faculty shortage might be reduced if the number of Ph.D. graduates were to increase. Russ, Thibodeau and Bedard (2009) and Braun, and Mauldin (2012) describe Ph.D. programs that encourage accounting practitioners to complete Ph.D. programs. However, at least in accounting, Ph.D. graduation numbers seem likely to fall short of retirement projections.

The inference appears to be that to avoid or reduce a business faculty shortage, more students should be encouraged to earn business Ph.D. degrees. However, this may raise the question of whether an increase in business Ph.D.s, combined with fewer than projected faculty openings, might result in a business Ph.D. surplus. Owen (2009) described a report by the AACBS (Association to Advance Collegiate Schools of Business) that predicted a business doctorate shortage in the 1980s. During the late 1980s, the number of business doctoral students increased. By the 1990s there was an oversupply of new business doctorates. As a specific illustration of the business doctorate surplus of the 1990s, Owen (2009, p 4) stated that “At the annual American Accounting Association meeting in 1992, 180 resumes were submitted to fill just 110 open positions”. This seems to suggest that if potential students are to be encouraged to spend several years pursuing business doctorates in hopes of someday finding jobs as highly paid business professors, more accurate predictions of business faculty openings may be warranted.

If projections of business faculty shortages are largely based on projections of faculty retirements, the question may arise of whether business faculty approaching retirement age will actually retire. Studies of college faculty members in general suggest that many professors may not intend to retire. For example, Flaherty (2013, page 1) reported that a Fidelity Investments study indicated that “74 percent of professors aged 49-67 plan to delay retirement past age 65 or never retire at all”. Reasons for not retiring included not just economic concerns, but personal and professional concerns as well, such as a desire to stay busy and productive.

The current study is a proposal for a study entailing a questionnaire survey of business faculty approaching retirement age. Questions will include respondents’ degree of inclination to retire, as well as questions regarding factors that might be related to inclination to retire.
THEORY AND HYPOTHESES

The inclination to retire may be related to the general concept of worker motivation. Theories such as Maslow’s Hierarchy of Needs (Maslow, 1943; Maslow 1954) and Herzberg’s Motivator-Hygiene Theory (Herzberg, Mausner and Snyderman, 1959) suggest that a number of conditions and components of a job affect satisfaction and motivation. It might be inferred that factors that make a person inclined to work may also make a person not inclined to retire.

Maslow’s hierarchy of needs theory suggests that the most basic needs are physiological needs, such as food and shelter. In terms of employment, compensation would enable a person to purchase food and shelter and otherwise satisfy physiological needs. Herzberg’s motivator-hygiene theory suggests that pay and fringe benefits and working conditions are hygiene factors that do not provide satisfaction. Rather, Herzberg theorized that the absence of hygiene factors causes dissatisfaction. It might be inferred that if inadequate retirement income were to give rise to dissatisfaction, a person who cannot afford to retire may feel compelled to continue to work.

Relating this to a business professor’s inclination to retire, it can be hypothesized that if a professor does not have assets sufficient to provide a comfortable living, a professor will not be inclined to retire. This can be expressed as Hypothesis # 1:

H1: Business professors who perceive their assets to be insufficient to provide a comfortable retirement will be more inclined to retire than those who perceive their assets to be sufficient.

Maslow’s hierarchy of needs theory suggests that if physiological needs are met, a person will focus on safety needs. In addition to a desire for safe working conditions and the avoidance of other threats to physical safety, safety needs include job security. In a passage that may be relevant for professors, Maslow (1943, p 379) stated “the expression of safety needs …. the common preference for a job with tenure and protection, the desire for a savings account, and for insurance of various kinds (medical, dental, unemployment, disability, old age).” Relating safety needs to retirement, a professor who has tenure, or at least has a reasonable expectation of continued employment, may be reluctant to give up a secure job for the uncertainties of retirement.

Expanding upon the concerns expressed in Hypothesis # 1, upon retirement, a retiree’s source of income is typically a combination of Social Security, pensions and personal investments. A comfortable retirement may be dependent on personal investments providing a supplement to Social Security and pensions for a lifetime that could reach age 100 or higher. Researchers who address the issue of retirement income (Finke, Pfau and Blanchett, 2013; Pfau, 2011) suggest that a combination of low interest rates on debt securities, a volatile stock market and long life expectancies could result in the depletion of a retiree’s assets.

A professor approaching retirement age may perceive that a portfolio of investment assets that might have been adequate during an earlier era may no longer be adequate. Such a professor may want to continue to work to postpone the need to spend investment assets, to increase investment assets and to otherwise decrease the likelihood of eventual asset depletion.

This can be expressed as Hypothesis # 2

H2: Business professors who perceive a high likelihood that they may eventually deplete their assets are less inclined to retire than professors who perceive the likelihood of asset depletion to be small.

Once basic needs have been fulfilled, Maslow’s hierarchy of needs theory suggests that higher level needs emerge that influence employees. Similarly, Herzberg’s motivator-hygiene theory suggests that a number of motivational factors can provide satisfaction. It might be inferred that if an employee achieves work satisfaction and the fulfillment of higher level needs, that employee may be inclined to work beyond normal retirement age even if the employee has assets sufficient to retire comfortably.

When an employee’s physiological and safety needs are met, Maslow’s hierarchy of needs theory suggests that affection and belongingness needs emerge. Although an employee may have interpersonal relationships outside of work, an employee may have friendships with co-workers that meet some of the affection and belongingness needs. A professor approaching retirement age who has worked for a university for many years may be reluctant to retire if it would mean curtailing friendships with co-workers.

This may be expressed as Hypothesis # 3:

H3: Business professors who would greatly miss their co-workers upon retirement are less inclined to retire than professors who would not greatly miss their co-workers.

Maslow’s hierarchy of needs theory suggests that beyond affection and belongingness, higher order needs of esteem and self-actualization emerge. Similarly, Herzberg’s motivator-hygiene theory suggests that motivation factors include recognition, sense of achievement and meaningfulness of work. A professor’s work may fulfill some of these needs. For example, teaching may provide satisfaction if the professor perceives that students are
learning and that the students will find good jobs upon graduation and will otherwise do better in life as a result of the professor’s work. Serving as an advisor to students may also provide a professor with the perception that advice and guidance enables students to improve their lives. Serving on committees, participating in university governance and other university service may provide a professor with a sense of achievement of the furtherance of university goals. Research and publication may provide esteem and recognition and a perception that the professor is making a contribution to the expansion of knowledge as well as a general sense of achievement and accomplishment. A professor who values these accomplishments may be inclined to work far beyond the time that work is financially necessary.

This leads to Hypothesis # 4, Hypothesis # 5, Hypothesis # 6, and Hypothesis # 7:

H4: A business professor who perceives teaching to be a source of satisfaction will be less inclined to retire than a professor who does not perceive teaching to be a source of satisfaction.

H5: A business professor who perceives advising students to be a source of satisfaction will be less inclined to retire than a professor who does not perceive advising students to be a source of satisfaction.

H6: A business professor who perceives the provision of university service to be a source of satisfaction will be less inclined to retire than a professor who does not perceive advising students to be a source of satisfaction.

H7: A business professor who perceives research and publication to be sources of satisfaction will be less inclined to retire than a professor who does not perceive research and publication to be a source of satisfaction.

**RESEARCH DESIGN**

The proposed study will entail a questionnaire survey of business faculty members. Questions will address demographics as well as perceptions and inclinations relevant to the hypotheses. To identify business faculty members who are approaching retirement age, the questionnaire will ask the respondent’s age and the types of courses they teach.

To measure inclination to retire, the questionnaire may ask whether the respondent expects to retire within the next year, the next five years, the next ten years, the next fifteen years, and possibly at what specific age the respondent expects to retire.

To measure the needs and motivation factors addressed in the hypotheses, questions may include:

- To what extent do you perceive your assets to be sufficient to provide for a comfortable retirement?
- To what extent do you perceive that your assets may be depleted during your lifetime?
- To what extent do you perceive that low interest rates on debt securities and volatile stock markets may adversely affect your investment assets?
- To what extent would you miss friendships with co-workers and students if you were to retire?
- To what extent do you perceive teaching to be a source of satisfaction?
- To what extent do you perceive advising students to be a source of satisfaction?
- To what extent do you perceive research and publications to be sources of satisfaction?
- To what extent do you perceive university service to be a source of satisfaction?

**METHODS OF ANALYSIS**

To measure the degree of respondents’ perceptions and intentions, the questions present a range of potential responses, perhaps on a scale of 1 through 5 or perhaps 1 through 7.

Analysis of results will entail statistical analyses, such as regression analysis, to determine whether results are consistent with the hypotheses. For some of the data, responses may be divided into two levels, which will allow ANOVA (Analysis of Variance) to be used.

**CONCLUSIONS**

This paper is a proposal for a study of motivational factors that may affect business professors’ inclinations to retire. The paper addresses the issue of reports of business faculty shortages and the factors that may affect such shortages. Topics include the potential effects of retirements on business faculty hiring needs. If a large proportion of
business faculty who are approaching retirement age were to retire, a faculty shortage could arise. However, if a substantial number of business faculty members were to continue to work beyond normal retirement age, the predicted shortage might not arise.

Some studies, such as Ruff, Thibodeau and Bedard (2009), which addressed accounting faculty, suggest that predictions of professor retirement that exceed new Ph.D. graduations, could result in a faculty shortage. Other studies, such as Flaherty’s (2013) study of professors in general, suggest that many professors plan to delay retirement past age 65.

Addressing the effects of increased numbers of Ph.D. graduates, Owen (2009) described reports of business doctorate shortages in the 1980s. Numbers of business doctorate output increased in the late 1980s. By the early 1990s, there was a business doctorate surplus. Owen suggests that many business doctorates in the early 1990s had difficulty finding academic jobs.

Considering the potential implications of inaccurate predictions of business professor retirements, a study of factors that affect professors’ inclinations to retire may be warranted. This paper is a proposal for a study that will address whether inclination to retire is affected by factors related to motivation and satisfaction, such as those described by Maslow’s Hierarchy of Needs (Maslow, 1943; Maslow, 1954) and Herzberg’s Motivator-Hygiene Theory (Herzberg, Mausner, and Snyderman, 1959). Factors will include perception of whether or not a professor’s assets are sufficient to provide a comfortable retirement, a professor’s perception of the likelihood of depletion of assets during retirement, social factors such as the degree to which a professor would miss co-workers upon retirement, as well as a professor’s perception that work provides a sense of accomplishment. These factors will include the degree of satisfaction that arises from teaching and advising students, the degree of satisfaction that arises from university service, and the degree of satisfaction that arises from research and publication.

Data will be collected through a questionnaire survey to be completed by business professors approaching retirement age. Questions will ask about perceptions of factors described in the hypotheses, as well inclination to retire. To test the hypotheses, statistical analyses will be performed.

The results may potentially provide university administrators with a better understanding of projections of business faculty hiring needs. The results may also potential doctoral students with a better understanding of prospects for finding academic employment upon completion of a business doctorate.

REFERENCES


ABSTRACT
This paper includes an examination of various financial statement data that can combine to explain a significant portion of the changes in U.S. commercial bank financial strength ratings. We examined financial statement data and corresponding financial strength ratings on over 6,300 commercial banks. We selected seven variables from a data set that included qualitative and quantitative financial statement data. The variables address the topics of bank capital, asset quality, earnings, liquidity, asset growth and mortgage concentration. We found that the selected variables explained approximately two thirds of bank financial strength rating changes during the credit crisis period of 2007 - 2010. We also found asset quality to be the most important factor in explaining bank financial strength ratings.

INTRODUCTION
Since the beginning of 2008, over 500 U.S. banks, S&Ls and thrifts have been closed by the Federal Deposit Insurance Corporation (FDIC). The failures represent institutions that possessed nearly $700 billion in total assets. While only 25 institutions failed in 2008, 140 institutions failed in 2009 and 157 additional institutions failed in 2010. The number of failures has dropped each year since 2010 with only 18 failures in 2014. This indicates the poor health of banking institutions during the credit crisis period of 2007-2010. It also indicates the improving health of the institutions since 2010. The details of bank failures from 2008-2014 are contained in Table 1.

As of the end of the 4th quarter of 2010, the Kroll Bond Rating Agency (KBRA) listed over 1,400 banks as watch list institutions of concern. KBRA (previously Lace Financial) is a Nationally Recognized Statistical Rating Organization (NRSRO), which provides quarterly financial strength ratings and financial data on U.S. banks, bank holding companies, credit unions and savings and loan institutions. KBRA is a subscription-based service which the researchers currently maintain as a business subscription. For purposes of this research, the researchers examined data on U.S. commercial banks only. It, therefore, excludes bank holding companies, thrifts and credit unions.

KBRA lists distressed financial institutions on its financial institution watch list. Watch list institution are defined as those institutions rated either “D” or “E”, the agency’s two lowest financial strength ratings. As of the end of 2010, the number of institutions on the FDIC problem institution list totaled over 800. FDIC problem institutions are defined by a capital adequacy, asset quality, management, earnings, liquidity, and sensitivity to market risk (CAMELS) rating of either 4 or 5. This is more than any other quarter over the past 10 years and 150 more institutions than what appeared four quarters previously at the end of 2009. As a matter of background, bank regulators provide financial institutions a CAMELS composite rating of 1 through 5. Generally, banks that receive CAMELS ratings of 1 or 2 are considered safe and sound while banks with CAMELS ratings of 4 or 5 exhibit unsafe and unsound practices or conditions, are critically deficient institutions and are of supervisory concern. It is common for institutions with ratings of 4 or 5 to operate under regulatory memorandums of understanding (MOUs) or cease and desist orders (C&Ds), which represent regulatory actions for prompt corrective action. A description of each CAMELS composite rating of 1 through 5 is provided in Table 2.

During the period 2007 - 2010, the average financial strength rating of the banking industry has mirrored the spike in the number of bank failures. The industry as a whole declined from a financial strength rating of roughly Baa2 at the end of 2007 to below Ba3 at the end of 2010. The decline in credit quality is a simple weighted average of the individual ratings of 6,363 commercial banks. For example, the rating of a bank with $100 million in assets was provided the same weighting as a bank with $100 billion in total assets. According to KBRA commercial bank data, 4,080 institutions had lower composite financial strength ratings as of 12/31/10 when compared to their 12/31/07 composite rating. This means that 64.0% of U.S. commercial banks in the dataset had a decline in credit quality over the three year period. This is indicative of the poor health of the U.S. banking industry during the 2007-2010 time period.

The remainder of this paper is organized as follows: the following section provides additional background on the banking industry as well as a literature review of prior research on bank failures and bank financial strength ratings. We complete the section by describing how this paper will add to the current literature. The third section provides a description of the data sources and data methods used in our research. The fourth section is a description of the findings of
our paper while the fifth section provides a summary and discussion of the paper’s findings.

LITERATURE REVIEW

Altman published two seminal works which considered financial ratios and the prediction of bankruptcy. Altman (1968) pioneered efforts in multiple discriminant analysis (MDA). More specifically, he used multiple financial ratios to predict corporate bankruptcy for manufacturing companies. While not as popular as multiple regression analysis, MDA is a statistical technique that can be used to classify objects into one of several a priori groupings dependent on the object’s qualitative characteristics. Altman found MDA to be an accurate predictor of bankruptcy with success 94% of the time. The research accomplished this by creating a ratio index that assigned corporations into either a bankruptcy group or a non-bankruptcy group. The model predicted failure as much as two years prior to bankruptcy. Altman (1977) updated the methodology and analysis by applying a MDA model to predict the failures of the savings and loan industry from 1966-1973. Similarly, Meyer and Pifer (1970) were one of the first researchers who used multiple regression analysis to classify institutions as either successes or failures. They also used MDA and found that their models predicted failure one to two years prior to the financial failure.

An alternative approach to the risk of bank failures and credit downgrade is also available. Halling and Hayden (2006) proposed a two-step survival time model as an approach modeling bank failures. The method utilized is based on a one-step multi-period logit model that ignores time information, and a one-step survival time model that assumes all banks are at-risk from the bank’s inception. The research found that the two-step model outperforms one-step logit models. Due to the recent credit crisis and the corresponding drop in the value of many assets, including loan portfolios and security portfolios, many banks have failed and/or have had their financial strength ratings downgraded. Whereas Altman (1977) examined the development of a system of financial ratios to identify institutions with significant financial problems, Athanassopoulos and Ballantine (1995) posited that ratio analysis needed to be supplemented with other evaluation methods such as data envelopment analysis. More recent literature includes Gropp, Vesala and Vulpes (2004) who looked at the leading indicators that equity and bond markets provide concerning a bank’s financial strength and vulnerabilities. In short, implied financial strength ratings and probabilities can be used to calculate credit risk and risk of failure.

Research on fair value accounting (FVA) and its effect on credit ratings is an area of financial research. Cifuentes, Ferrucci and Shin (2005) evaluated the liquidity risks of combining mark-to-market accounting with minimum capital requirements. Through simulation, the research asserted that a drop in the market value of bank assets could induce further price drops due to mark-to-market accounting. After an initial asset price drop, banks sell assets placing further downward asset price pressure on those banks that chose to retain similar assets. The result is a circular and repetitive wave of bank asset sales and subsequent asset price decreases. The end results are contagious bank failures and bank rating downgrades. Similarly, Plantin, Sapra, and Shin (2008) examined the differences between historical cost accounting and mark-to-market accounting. They found that mark-to-market accounting can inject artificial volatility to the value of prices and financial statement information. They asserted that damage could be done to financial institutions when claims on the assets are long-term, illiquid and senior. As a note of emphasis, both research pieces were completed prior to the recent credit crisis. Both concluded that a rapid shift to mark-to-market accounting could be detrimental to financial intermediation and economic growth. With respect to the aforementioned, Khan (2010) found an association link between fair value accounting and bank contagion by looking at systemic risk of the banking system as measure by bank equity returns. Lastly, by looking at time event windows in the fall of 2008 and early 2009, Bowen, Khan and Rajgopal (2010) assessed market reaction to the relaxing of the FVA standards. They found a positive relation between potential changes in FVA/impairment rules and bank equity values.

Lastly, mortgage backed securities have been cited as a potential cause or contributor to the current credit crisis. Mian and Sufi (2008) stated that a rapid supply of mortgages explained a large percentage of home price appreciation in the housing boom as well as the subsequent default spike. Similarly, Dodd (2007) cited poor underwriting in subprime mortgages as the cause of the downturn in the financial markets. Mah-Hui (2008) attempted to explain the cause of the subprime crisis and postulated that the current wave of bank failures is similar to the leveraging and funding mismatches found during the U.S. savings and loan crisis of the 1980s as well as the Asian financial crisis of the 1990s. So the question remains: are there ratios and, more broadly, financial statement data that could provide an indication of those banks that will face credit downgrade and therefore face increased risk of failure? In addition, are there specific items, such as mortgage backed data, that are associated with troubled banking institutions? We attempt to answer those questions in the below Data and Data Methodologies Section of our research.

To add to the current body of research, we evaluated data on over 6,300 financial institutions. To our knowledge, a widespread analysis on financial institution rating has not been previously conducted. The research builds on the U.S. bank regulatory approach and adds several metrics not explicitly included in the regulatory bank ratings. The combination of practical and theoretical concepts will allow
this research to have a broad audience.

DATA AND DATA METHODOLOGIES

The primary data source utilized for this research was KBRA commercial bank data. For the 2007 through 2010 end-of-the-year data sets, KBRA maintained data on over 6,400 institutions. A maximum of 6,872 financial institutions are contained in the 2009 dataset while a minimum of 6,449 institutions are contained in the 2010 data set. Over 150 data fields are available in each data set, which includes administrative, balance sheet, income statement and financial ratio data on each financial institution. In addition, the data set includes KBRA ratings for the current quarter, each of the prior three quarters as well as the year end ratings for the previous three calendar years. Thus, the 12/31/2010 data set includes KBRA financial strength ratings for 12/31/2010, 9/30/2010, 6/30/2010, 3/31/2010, 12/31/2009, 12/31/2008 and 12/31/2007.

As a matter of background, financial strength ratings are a non-numerical, qualitative measure. KBRA utilizes ratings of “A+” through “E” to classify institutions from the strongest performers to the weakest performers. A rating value of “A+” is assigned to healthy institutions while ratings of “E” are assigned to poorly performing institutions. A complete list of KBRA ratings, their mapping to other NRSRO financial strength ratings and their conversion to a weighted average rating factor (WARF) is provided in the Table 3. Utilizing rating conversions ascribed in the mapping table, we converted the KBRA financial strength ratings from qualitative data to WARF, which is a numerical rating measure. WARF is a measure that was created by Moody’s Investors Service (MIS) based on historical corporate default rates. WARF is an estimate of the 10-year default rate for a given borrower at a given rating category. It thus is a measure of the probability that a financial institution with a given financial strength rating will subsequently default. For example, an institution with a KBRA rating of “B-”, translates to a MIS rating of ”Baa1” and a WARF of 260. This means that the bank has an approximately 2.6% probability of default over the subsequent 10 years. Similarly, a bank rated “E” by KBRA maps to a Moody’s rating of “Ca” and historically has experienced a 100% default rate (given its WARF of 10,000). Thus, an institution that has a WARF increase from 260 to 10,000 is indicative of an increase in risk of default from 2.6% to 100%. Conversely, a decrease in WARF indicates a decrease in risk of default. Converting the KBRA qualitative financial strength ratings to a WARF numerical measure enabled the calculation of financial strength rating summary statistics and other financial strength rating statistical inferences.

For the purposes of comparability amongst the 2007, 2008, 2009 and 2010 analyses, only the 6,363 institutions that appeared in each of the four years of databases were included in the final sample. The field “cert” provides a unique identifier which was matched up for each of the institutions included in the sample. Institutions in the KBRA database that were excluded were done so either because: 1. they failed during the period of study (2007-2010) and thus did not have ratings for each quarter measured and/or 2. they were de novo institutions at some point during the study (12/2007); and/or 3. were not rated by KBRA for at least one period during the period (2007 - 2010). The exclusion of institutions means that survivorship bias and selection bias are part of the sample. However, given the relatively low exclusion percentages, the degree of bias is minor. As was noted above, the sample size of 6,363 compares to 6,449 total institutions in the 2010 database, 6,872, institutions in the 2009 database, 6,841 institutions in the 2008 database and 6,752 in institutions in the 2007 database. This indicates exclusion rates of 1.3% for the 2010 data, 7.4% for the 2009 data, 7.0% for the 2008 data and 5.7% for the 2007 data. Given the relatively low exclusion rates, the survivorship and selection biases had a negligible impact on the statistical tests and results.

As was previously noted, we had over 150 data fields in the data set from which to choose the independent variables. The researchers selected one field from each of the main regulatory rating areas of capital adequacy, asset quality, management earnings and liquidity. Sensitivity to market risk was not measured. However, a metric for asset growth and exposure to mortgage products were included in an attempt to improve the model’s explanatory power. Similarly, a proxy for management skill was utilized. The management proxy ratio, loan loss reserves/nonperforming assets, was utilized to determine bank management’s willingness to provide for loan loss reserves as this should be associated with financial strength rating.

In an attempt to maximize the fields selected for analysis, prior research was examined to determine what prior researcher had utilized. Horrigan (1966) looked at the use of financial ratios in an attempt to explain Moody’s and S&P financial strength ratings of manufacturing firms. Cantor and Packer (1996) suggested that a combination of income, capital, growth and investment metrics could be utilized to explain sovereign financial strength ratings. In addition to prior research, we utilized current regulator metrics as guidance in the ratio selection process. The researchers selected one variable for each of the CAMEL components. The researchers classified each field in the database to one of the CEMPLE components and selected the metric that maximized the explanatory power of the model. These three sources along with our perspective allowed for the selection of the seven metrics to explain bank financial strength ratings in the years 2007 through 2010. Each variable, along with its topic area and correlation to each year’s financial strength rating change, is provided in Table 4.
The assets ratio, nonperforming assets/average assets, exhibits the strongest association with financial strength ratings as it has a correlation of over 80% in years 2008, 2009 and 2010. Earnings seems to be the next most important factor as it has a correlation of just over 50% with 2009 financial strength ratings. Some interesting trends can also be noted in the above correlations of the individual components to overall financial strength rating. However, the trends may raise more questions than they answer. For example, the capital ratio has a greater association to financial strength ratings as the credit crisis progressed in 2008 and 2009 but then a decline in the importance in the variable in 2010. Does this indicate that capital has more importance during crises or is this just an anomaly? The assets, management, earnings and liquidity ratios exhibit similar trends. As expected, the asset and liquidity ratios are positively correlated with higher credit risk while the capital, management and earnings are negatively correlated with higher credit risk. Since the asset metric is a measure of nonperforming assets, it is logical that a bank with a larger percentage of nonperforming assets on its balance sheet would have a lower financial strength rating (and thus have higher credit risk). Since the liquidity ratio is more accurately a measure of bank illiquidity, it exhibits similar correlation characteristics as the nonperforming assets ratio. Lastly, the growth and mortgage concentration proxies have greater associations with financial strength rating as the crisis wore on and did not trend lower in 2010 as with the other ratios.

Descriptive statistics on each of the seven variables for each year are provided in Tables 5a and 5b. Two tables have been provided: one for 2007 and 2008 and one for 2009 and 2010. In addition, a total of eight descriptive statistics have been included in each table.

RESULTS

As noted above, the seven ratios we selected to explain financial strength ratings appear in Table 4. The detailed results of the regressions appear in Tables 6a through 6d. One table is provide for each year. For example, the regression results for 2010 appears in Table 6a. Two tables were constructed for each calendar year. However, due to manuscript space constraints only one set of tables are included in the paper. The presented tables show the five CAMEL ratios as well as additional metrics for assets growth and mortgage concentration. Three sections appear in each table: 1. the overall regression results, 2. an analysis of variance (ANOVA) table; and 3. the dependent and independent variables, their coefficients, standard errors and indicators of significance.

In 2007, the five CAMEL ratios explained approximately 57.2% of 2007 bank financial strength ratings. In 2008, the CAMEL ratios exhibited a better fit as they explained 68.2% of the 2008 bank financial strength ratings. In 2009, the upward trend continued as the CAMEL ratios explained 71.5% of the financial strength ratings data. However, the goodness of fit decreased in 2010 as the CAMEL ratios explained only 68.6% of 2010 bank financial strength ratings. On average the CAMEL ratios explained approximately 66.3% of commercial bank ratings data over the period 2007-2010.

In addition to the CAMEL regressions, we performed additional regressions to test whether other variables increased the models’ explanatory power. We also performed additional regressions to test the model’s robustness. For each of the years 2007 through 2010, we included two additional variables in the model: annual change in total assets (%CAA) and interest income from mortgage backed securities as a percent of total interest income (MBS%). The %CAA ratio was utilized because Cantor and Packer (1996) cited growth as positively associated with financial strength ratings. The MBS% variable was included to test whether the data supported the contention that mortgages were associated with much of the financial strain during the credit crisis. This is consistent with Hui’s (2008) research on mortgages and financial institutions. While both the annual growth and mortgage metrics showed individual associations with bank financial strength ratings, neither increased the explanatory power of the model by a material amount. For example, in 2010, when we included the additional two variables in the model, this increased the model’s explanatory power from 68.6% to 68.8%. Minor improvements in goodness of fit also occurred when the two variables were added to the 2007, 2008 and 2009 models. Tables 6a through 6d provide detailed results of the incremental improvements for years 2007 through 2010.

We also performed additional regressions on the data to determine if a lag improved the explanatory power of the model. For example, we utilized 7 independent variables for 2009 to attempt to explain 2010 financial strength ratings. However, the goodness of fit decreased from 68.8% to 56.9%. Similar results occurred for other years in the study. To determine how well the model held up without asset quality, the variable with the most explanatory power, we ran the 2010 model without the variable. The explanatory power of the 2010 model dropped from 68.8% to 29.8%. So while the 2010 model still explained a portion of the financial strength ratings without the asset variable, its results were significantly weaker. As expected, asset quality is the most powerful independent variable in explaining commercial bank financial strength rating.

Three of the five CAMELS independent variables, return on assets ratio, tier 1/leverage ratio and non-performing assets ratio, were significant at a 95% confidence level in each of the years 2007 through 2010. The loan loss reserve was significant at 95% confidence in 2007 and 2008 only. Only CDs as a percentage of average assets failed to be significant.
at a 95% confidence for all four years of the study. The ANOVA table supports the individual variable results as it indicates that at least one of the variables is significant at a 95% confidence level in each of the four years.

Cantor and Packer (1996) indicated that several of their independent variables exhibited high correlations with each other. As a result they had to address the concept of multicollinearity. While we expected a measure of multicollinearity amongst our independent variables, its presence was not evident when we tested the data. We took two steps to decrease the likelihood that multicollinearity would impact the results. First, we excluded multiple ratios from a given topic area in an attempt to avoid the issue. For example, we excluded the capital ratio “Tier 1 capital/risk weighted assets” as it exhibits a high degree of correlation with the capital ratio utilized (Tier 1 capital/leverage assets). Secondly, we constructed a correlation matrix to calculate the correlations amongst the 28 dependent variables in the study (seven dependent variables per year for four years). While the ROA metric (and others) displayed high correlations with lagged values on itself, multicollinearity does not appear to be problematic. For example, the independent variable “2010 ROA” had a mean correlation of 6.4% with the other 27 independent variables. Similarly, the average mean correlation amongst all the independent variables was 6.1%.

CONCLUSIONS AND DISCUSSION

This paper was designed to help both theoreticians and practitioners understand the variables that impact financial institution financial strength ratings. By explaining roughly two-thirds of U.S commercial bank financial strength rating changes during the recent credit crisis, we have helped take a necessary step in this process. The seven ratios that we utilized are financial statement metrics commonly used in the banking industry and in bank regulation. Our finding that asset quality is the most powerful explanatory variable in bank financial strength ratings was expected. Conversely, the lack of association between mortgage backed security concentration and ratings was unanticipated. We believe the MBS results were more due to the lack of quality and detailed MBS data than a lack of association to bank financial strength rating.

Using a proxy for each of the CAMELS metrics, the paper’s results may indicate similarity between the FSR process and the bank regulatory ratings. Assuming that FSRs appropriately identify bank risk, the paper’s results may validate the CAMELS ratings system. In other words, the results may also indicate that bank regulators have correctly identified the bank areas which indicate risk. Given the large number of bank failures in the U.S. over the past 8 years, the results may also indicate that both NRSROs and bank regulators have missed proper areas that indicate risk of default.

Further research can be conducted in the area of financial institution financial strength ratings. As was noted above, we researched only U.S. commercial banks during the period 2007-2010. The research was based on annual data only. Many directions can be taken to further the research to increase the understanding of financial institution financial statement data and its association with bank financial strength ratings. Several different possibilities include: increasing the time frame studies to include the boom economy years of 2002-2006, increasing the frequency of financial statement data to include quarterly observations and changing the type of institutions studied from commercial banks to other type of financial institution. Examples of other types of institutions include bank holding companies and savings and loans. Lastly, time series studies which examine the change in financial strength rating from period to period could be compared to financial ratio changes over the same time period could be performed. Once a better understanding of financial institution ratings are achieved the same data and approach might be used to pursue an analysis on the over 500 U.S. financial institutions that have failed since the beginning of 2008.

In addition, financial institutions that have recognized other than temporary income (OTTI) could be studied. The question of whether a relationship exists between the size of OTTI recognition and the subsequent change in the financial strength rating of the institution could be explored. Dodd (2010) noted that structured product security portfolios have caused asset quality problems in financial institutions during the credit crisis. This topic could be compared to the change in size of securities portfolios at institutions that did not recognize OTTI. The comparison would attempt to determine if there’s an association between the accounting treatment and bank portfolio decisions. Determining such an association may help provide an indication of whether banks pared their security portfolios in response to accounting losses. This is an issue of bank use of fair value accounting as well as the regulator use of minimum capital requirement. This issue has been previously explored by Landsman (2006), who examined bank regulators use of fair value accounting when determining bank regulatory capital and when making regulatory decisions. Similarly, Kisgen (2006) examined whether financial strength ratings affect capital structure decisions.
REFERENCES


APPENDIX

Table 1: Bank Failure Data by Year. Asset amounts are in millions of dollars.

<table>
<thead>
<tr>
<th>Year</th>
<th>Failures</th>
<th>Total Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>25</td>
<td>373,578</td>
</tr>
<tr>
<td>2009</td>
<td>140</td>
<td>163,755</td>
</tr>
<tr>
<td>2010</td>
<td>157</td>
<td>95,975</td>
</tr>
<tr>
<td>2011</td>
<td>92</td>
<td>35,728</td>
</tr>
<tr>
<td>2012</td>
<td>51</td>
<td>12,056</td>
</tr>
<tr>
<td>2013</td>
<td>24</td>
<td>6,122</td>
</tr>
<tr>
<td>2014</td>
<td>18</td>
<td>3,045</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>507</strong></td>
<td><strong>690,259</strong></td>
</tr>
</tbody>
</table>

Table 2: CAMELS composite ratings table

<table>
<thead>
<tr>
<th>RATING</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Institutions in this group are basically sound in every respect; any critical findings or comments are of a minor nature and can be handled in a routine manner. Such institutions are resistant to external economic and financial disturbances and more capable of withstanding the vagaries of business conditions than institutions with lower ratings. As a result, such institutions give no cause for supervisory concern.</td>
</tr>
<tr>
<td>2</td>
<td>Institutions in this group are also fundamentally sound, but may reflect modest weaknesses correctable in the normal course of business. The nature and severity of deficiencies, however, are not considered material and, therefore, such institutions are stable and also able to withstand business fluctuations quite well. While areas of weakness could develop into conditions of greater concern, the supervisory response is limited to the extent that minor adjustments are resolved in the normal course of business, and operations continue satisfactorily.</td>
</tr>
<tr>
<td>3</td>
<td>Institutions in this category exhibit a combination of financial, operational or compliance weaknesses ranging from moderately severe to unsatisfactory. When weaknesses relate to financial condition, such institutions may be vulnerable to the onset of adverse business conditions and could easily deteriorate if concerted action is not effective in correcting the areas of weakness. Institutions which are in significant noncompliance with laws and regulations may also be accorded this rating. Generally, these institutions give more cause for supervisory concern and require more than normal supervision to address deficiencies. Overall strength and financial capacity, however, are still such as to make failure only a remote possibility.</td>
</tr>
</tbody>
</table>
Institutions in this group have an immoderate volume of serious financial weaknesses or a combination of other conditions that are unsatisfactory. Major and serious problems or unsafe and unsound conditions may exist which are not being satisfactorily addressed or resolved. Unless effective action is taken to correct these conditions, they could reasonably develop into a situation that could impair future viability, constitute a threat to the interests of depositors and/or pose a potential for disbursement of funds by the insuring agency. A higher potential for failure is present but is not yet imminent or pronounced. Institutions in this category require close supervisory attention and financial surveillance and a definitive plan for corrective action.

This category is reserved for institutions with an extremely high immediate or near term probability of failure. The volume and severity of weaknesses or unsafe and unsound conditions are so critical as to require urgent aid from stockholders or other public or private sources of financial assistance. In the absence of urgent and decisive corrective measures, these situations will likely require liquidation and the payoff of depositors, disbursement of insurance funds to insured depositors, or some form of emergency assistance, merger or acquisition.

Table 3 – Kroll Bond Rating Association (KBRA) 2010 financial strength ratings Mapping Table

<table>
<thead>
<tr>
<th>KBRA</th>
<th>A.M. Best</th>
<th>Moody’s</th>
<th>S&amp;P</th>
<th>Fitch</th>
<th>WARF</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>Aaa</td>
<td>Aaa</td>
<td>AAA</td>
<td>AAA</td>
<td>1</td>
</tr>
<tr>
<td>aa+</td>
<td>Aa1</td>
<td>AA+</td>
<td>AA+</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Aa</td>
<td>Aa2</td>
<td>AA</td>
<td>AA</td>
<td>20</td>
</tr>
<tr>
<td>B+</td>
<td>aa-</td>
<td>Aa3</td>
<td>AA-</td>
<td>AA-</td>
<td>40</td>
</tr>
<tr>
<td>a+</td>
<td>A1</td>
<td>A+</td>
<td>A+</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>A</td>
<td>A2</td>
<td>A</td>
<td>A</td>
<td>120</td>
</tr>
<tr>
<td>a-</td>
<td>A3</td>
<td>A-</td>
<td>A-</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>B-</td>
<td>Bbb+</td>
<td>Baa1</td>
<td>BBB+</td>
<td>BBB+</td>
<td>260</td>
</tr>
<tr>
<td>Bbb</td>
<td>Baa2</td>
<td>BBB</td>
<td>BBB</td>
<td>360</td>
<td></td>
</tr>
<tr>
<td>C+</td>
<td>Bbb-</td>
<td>Baa3</td>
<td>BBB-</td>
<td>BBB-</td>
<td>610</td>
</tr>
<tr>
<td>C</td>
<td>bb+</td>
<td>Ba1</td>
<td>BB+</td>
<td>BB+</td>
<td>940</td>
</tr>
<tr>
<td>Bb</td>
<td>Ba2</td>
<td>BB</td>
<td>BB</td>
<td>1250</td>
<td></td>
</tr>
<tr>
<td>bb-</td>
<td>Ba3</td>
<td>BB-</td>
<td>BB-</td>
<td>1760</td>
<td></td>
</tr>
<tr>
<td>C-</td>
<td>b+</td>
<td>B1</td>
<td>B+</td>
<td>B+</td>
<td>2220</td>
</tr>
<tr>
<td>B</td>
<td>B2</td>
<td>B</td>
<td>B</td>
<td>2720</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>Financial Ratio / Statement Item</td>
<td>2007</td>
<td>2008</td>
<td>2009</td>
<td>2010</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------------------------------------</td>
<td>---------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Capital</td>
<td>Tier1/Leverage</td>
<td>-8.10%</td>
<td>-12.77%</td>
<td>-19.46%</td>
<td>-14.00%</td>
</tr>
<tr>
<td>Assets</td>
<td>Nonperforming Assets / Average. Assets</td>
<td>75.17%</td>
<td>82.12%</td>
<td>83.74%</td>
<td>82.06%</td>
</tr>
<tr>
<td>Management</td>
<td>Loan Loss Res / Nonperforming Assets</td>
<td>-17.13%</td>
<td>-24.75%</td>
<td>-27.11%</td>
<td>-26.10%</td>
</tr>
<tr>
<td>Earnings</td>
<td>Current ROA</td>
<td>-13.87%</td>
<td>-31.40%</td>
<td>-50.37%</td>
<td>-46.13%</td>
</tr>
<tr>
<td>Liquidity</td>
<td>CDs Greater Than $100k/Average Assets</td>
<td>5.71%</td>
<td>10.00%</td>
<td>12.70%</td>
<td>-1.40%</td>
</tr>
<tr>
<td>Growth</td>
<td>Annual Change in Total Assets</td>
<td>-2.50%</td>
<td>-6.30%</td>
<td>-13.30%</td>
<td>-20.53%</td>
</tr>
<tr>
<td>Mortgages</td>
<td>Interest Income - MBS % of Income</td>
<td>-4.37%</td>
<td>-5.36%</td>
<td>-7.84%</td>
<td>-8.34%</td>
</tr>
</tbody>
</table>

Table 4: Independent Variables The below table includes a list of the seven independent variables, each variable’s topic area and each variable’s correlation to bank rating data for the years 2007 through 2010.
Table 5a: 2009 and 2010 Summary Statistics.

The following table provides summary statistics on the KBRA database fields utilized to explain bank financial strength ratings. Note that each statistic is based on 6,363 observations and the table applies to 2 calendar years: 2010 and 2009. ROA is the income measure return on assets; LLR / NPA is loan loss reserve / nonperforming assets; T/LA is tier 1 capital / leverage assets; CDs / AA is CDs greater than $100k / Average Assets; NPA / AA is Loan Loss Reserves / nonperforming assets; MBS% is mortgage backed security interest income as a percent of total interest income; and %CAA is annual percentage change in total assets.

<table>
<thead>
<tr>
<th>Calendar Year 2009</th>
<th>Calendar Year 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statistic</strong></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.31</td>
</tr>
<tr>
<td>Median</td>
<td>0.57</td>
</tr>
<tr>
<td>Minimum</td>
<td>-27.11</td>
</tr>
<tr>
<td>Maximum</td>
<td>46.54</td>
</tr>
<tr>
<td>Range</td>
<td>73.65</td>
</tr>
<tr>
<td>Sigma</td>
<td>1.79</td>
</tr>
<tr>
<td>Variance</td>
<td>3.19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Variable</strong></th>
<th><strong>2009</strong></th>
<th><strong>2010</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1.19</td>
<td>2.67</td>
</tr>
<tr>
<td>NPKA</td>
<td>0.95</td>
<td>1.02</td>
</tr>
<tr>
<td>NPKA%</td>
<td>63.63</td>
<td>63.63</td>
</tr>
<tr>
<td>NPKA/AA</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>NPKA/AA%</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>T/LA</td>
<td>1.19</td>
<td>1.19</td>
</tr>
<tr>
<td>T/LA%</td>
<td>63.63</td>
<td>63.63</td>
</tr>
<tr>
<td>T/LA/AA</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>T/LA/AA%</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>ROA/TLR/PA</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>ROA/TLR/PA%</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>ROA/NPA</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>ROA/NPA%</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>ROA/AA</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>ROA/AA%</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>MBS%</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>MBS%/AA</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>MBS%/AA%</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>%CAA</td>
<td>0.31</td>
<td>0.46</td>
</tr>
<tr>
<td>%CAA/AA</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>%CAA/AA%</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Note: These tables should be read horizontally, not vertically. The following table provides summary statistics on the KBRA database fields utilized to explain bank financial strength ratings.

**Table 5a:** 2009 and 2010 Summary Statistics.
Table 5b: 2007 and 2008 Summary Statistics.

The following table provides summary statistics on the KBRA database fields utilized to explain bank financial strength ratings. Note that each statistic is based on 6,363 observations and the table applies to 2 calendar years: 2008 and 2007. ROA is the income measure return on assets; LLP / NPA is loan loss reserve / nonperforming assets; T/LA is tier 1 capital / leverage assets; CDs / AA is CDs greater than $100k / Average Assets, NPA / AA is Loan Loss Reserves / nonperforming assets; MBS% is mortgage backed security interest income as a percent of total interest income; and %CAA is annual percentage change in total assets.

<table>
<thead>
<tr>
<th>Calendar Year 2007</th>
<th>Calendar Year 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statistic</strong></td>
<td><strong>Mean</strong></td>
</tr>
<tr>
<td>ROA</td>
<td>0.00</td>
</tr>
<tr>
<td>LLP / NPA</td>
<td>0.00</td>
</tr>
<tr>
<td>T/LA</td>
<td>0.00</td>
</tr>
<tr>
<td>CDs / AA</td>
<td>0.00</td>
</tr>
<tr>
<td>NPA / AA</td>
<td>0.00</td>
</tr>
<tr>
<td>MBS%</td>
<td>0.00</td>
</tr>
<tr>
<td>%CAA</td>
<td>0.00</td>
</tr>
</tbody>
</table>
Table 6a: Determinants of 2010 Bank Financial Strength Ratings.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-Value</th>
<th>P-Value</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>30.37</td>
<td>88.07</td>
<td>-0.35</td>
<td>0.73</td>
<td>-201.31</td>
<td>261.07</td>
</tr>
<tr>
<td>ROA</td>
<td>7.94</td>
<td>2.46</td>
<td>3.26</td>
<td>0.00</td>
<td>-1.17</td>
<td>17.11</td>
</tr>
<tr>
<td>LLR/NPA</td>
<td>0.06</td>
<td>0.12</td>
<td>0.51</td>
<td>0.61</td>
<td>-0.18</td>
<td>0.30</td>
</tr>
<tr>
<td>T/LA</td>
<td>0.18</td>
<td>0.10</td>
<td>1.82</td>
<td>0.08</td>
<td>0.02</td>
<td>0.36</td>
</tr>
<tr>
<td>LII/NPA</td>
<td>0.30</td>
<td>0.06</td>
<td>5.39</td>
<td>0.00</td>
<td>0.18</td>
<td>0.42</td>
</tr>
<tr>
<td>ROA</td>
<td>246.96</td>
<td>17.04</td>
<td>14.58</td>
<td>0.00</td>
<td>-280.36</td>
<td>-213.56</td>
</tr>
<tr>
<td>LLR/NPA</td>
<td>0.06</td>
<td>0.12</td>
<td>0.51</td>
<td>0.61</td>
<td>-0.18</td>
<td>0.30</td>
</tr>
<tr>
<td>T/LA</td>
<td>0.18</td>
<td>0.10</td>
<td>1.82</td>
<td>0.08</td>
<td>0.02</td>
<td>0.36</td>
</tr>
<tr>
<td>LII/NPA</td>
<td>0.30</td>
<td>0.06</td>
<td>5.39</td>
<td>0.00</td>
<td>0.18</td>
<td>0.42</td>
</tr>
<tr>
<td>ROA</td>
<td>246.96</td>
<td>17.04</td>
<td>14.58</td>
<td>0.00</td>
<td>-280.36</td>
<td>-213.56</td>
</tr>
</tbody>
</table>

Regression Statistics

- Multiple R: 0.82
- R Square: 68.77%
- Adjusted R Square: 68.77%
- Standard Error: 201.31
- F-Value: 201.31
- Significance F: 0.00

ANOVA

- df: 7
- MS: 7209705441
- F: 201.31
- Significance F: 0.00

The table above contains the regression analysis results for 2010 bank financial strength.
Table 6b: Determinants of 2009 Bank Financial Strength Ratings.

The table below contains the regression results for 2009 bank financial strength ratings.

<table>
<thead>
<tr>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t-value</th>
<th>P-value</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-86.81</td>
<td>-1.09</td>
<td>0.28</td>
<td>-243.19</td>
<td>69.57</td>
</tr>
<tr>
<td>ROA</td>
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<td>-13.78</td>
<td>0.00</td>
<td>-226.28</td>
<td>-169.92</td>
</tr>
<tr>
<td>LLR/NPA</td>
<td>0.25</td>
<td>1.47</td>
<td>0.14</td>
<td>-0.08</td>
<td>0.59</td>
</tr>
<tr>
<td>T/LA</td>
<td>-29.08</td>
<td>-6.54</td>
<td>0.00</td>
<td>-37.80</td>
<td>-20.36</td>
</tr>
<tr>
<td>CDs/AA</td>
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<td>1.33</td>
<td>0.18</td>
<td>-1.67</td>
<td>8.68</td>
</tr>
<tr>
<td>NPA/AA</td>
<td>0.25</td>
<td>0.17</td>
<td>1.47</td>
<td>-0.08</td>
<td>0.59</td>
</tr>
<tr>
<td>NPA/AA</td>
<td>0.25</td>
<td>0.17</td>
<td>1.47</td>
<td>-0.08</td>
<td>0.59</td>
</tr>
<tr>
<td>%CAA</td>
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<td>0.00</td>
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<td>957.45</td>
</tr>
<tr>
<td>MBS%</td>
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<td>-3.96</td>
<td>0.00</td>
<td>-6.70</td>
<td>-2.26</td>
</tr>
<tr>
<td>Adj R Square</td>
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<td>9.06</td>
<td>0.00</td>
<td>8.67</td>
<td>10.39</td>
</tr>
<tr>
<td>Multiple R</td>
<td>0.96</td>
<td>1.67</td>
<td>0.00</td>
<td>0.45</td>
<td>0.62</td>
</tr>
<tr>
<td>R Square</td>
<td>0.71</td>
<td>9.06</td>
<td>0.00</td>
<td>0.45</td>
<td>0.62</td>
</tr>
</tbody>
</table>

2009 Regression Statistics

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>7</td>
<td>691444409</td>
<td>9837110863</td>
<td>4924615919</td>
<td>6355</td>
</tr>
<tr>
<td>Residual</td>
<td>6355</td>
<td>9837110863</td>
<td>691444409</td>
<td>4924615919</td>
<td>6355</td>
</tr>
<tr>
<td>Total</td>
<td>6763472781</td>
<td>9837110863</td>
<td>691444409</td>
<td>4924615919</td>
<td>6355</td>
</tr>
</tbody>
</table>

The table below contains the regression results for 2009 bank financial strength ratings.
Table 6c: Determinants of 2008 Bank Financial Strength Ratings.

The table below contains the regression results for 2008 bank financial strength ratings.

<table>
<thead>
<tr>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t-Stat</th>
<th>P-value</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-477.78</td>
<td>73.44</td>
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<td></td>
</tr>
<tr>
<td>ROA</td>
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<td>13.28</td>
<td>-6.91</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>LLR/NPA</td>
<td>0.68</td>
<td>0.14</td>
<td>4.68</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>T/LA</td>
<td>-25.70</td>
<td>6.89</td>
<td>-3.77</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>1.77</td>
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<td>-0.77</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>MBS%</td>
<td>0.65</td>
<td>0.88</td>
<td>0.73</td>
<td>0.46</td>
<td>2.37</td>
</tr>
<tr>
<td>NPA/NPA</td>
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<td>11.39</td>
<td>102.53</td>
<td>0.00</td>
<td>1145.95</td>
</tr>
<tr>
<td>%CAA</td>
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<td>238.21</td>
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<td>238.21</td>
</tr>
<tr>
<td>CDS/AA</td>
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<td>0.99</td>
<td>9.53</td>
<td>0.00</td>
<td>9.53</td>
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</table>

**2008 Regression Statistics**

<table>
<thead>
<tr>
<th>Df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Significance F</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>1825322260</td>
<td>259332537</td>
<td>7.14</td>
<td>0.005</td>
</tr>
<tr>
<td>635</td>
<td>13556900000</td>
<td>211602668</td>
<td>2.02</td>
<td>0.007</td>
</tr>
</tbody>
</table>

**ANOVA**

<table>
<thead>
<tr>
<th>Df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Significance F</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>1825322260</td>
<td>259332537</td>
<td>7.14</td>
<td>0.005</td>
</tr>
<tr>
<td>635</td>
<td>13556900000</td>
<td>211602668</td>
<td>2.02</td>
<td>0.007</td>
</tr>
</tbody>
</table>

2008 Regression Statistics

Table 6c: Determinants of 2008 Bank Financial Strength Ratings. The table below contains the regression results for 2008 bank financial strength ratings.
Table 6d: Determinants of Bank 2007 Financial strength ratings.

The table below contains the regression results for 2007 bank financial strength ratings.

<table>
<thead>
<tr>
<th></th>
<th>Multiple R</th>
<th>Adj. Multiple R</th>
<th>R Square</th>
<th>Adj. R Square</th>
<th>%MB%</th>
<th>%CA%</th>
<th>NpA/NpA %</th>
<th>CDs/AA</th>
<th>T/LA</th>
<th>LTR/NPA %</th>
<th>ROA</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-1.65</td>
<td></td>
<td>0.05</td>
<td>0.93</td>
<td>0.42</td>
<td>0.82</td>
<td>690.78</td>
<td>197.84</td>
<td>1.17</td>
<td>103.1</td>
<td>0.52</td>
<td>4.89</td>
</tr>
<tr>
<td>LOA</td>
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<td></td>
<td>0.00</td>
<td>0.06</td>
<td>0.05</td>
<td>0.12</td>
<td>0.91</td>
<td>0.03</td>
<td>0.16</td>
<td>0.01</td>
<td>0.91</td>
<td>0.02</td>
</tr>
<tr>
<td>NpA/AA</td>
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<td></td>
<td>0.00</td>
<td>0.02</td>
<td>0.04</td>
<td>0.07</td>
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<td>0.02</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>T/LA</td>
<td>0.03</td>
<td></td>
<td>0.00</td>
<td>0.04</td>
<td>0.03</td>
<td>0.12</td>
<td>0.05</td>
<td>0.01</td>
<td>0.04</td>
<td>0.01</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>LLR/NPA%</td>
<td>0.01</td>
<td></td>
<td>0.00</td>
<td>0.03</td>
<td>0.01</td>
<td>0.07</td>
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<td>0.02</td>
<td>0.01</td>
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<tr>
<td>CDs/AA</td>
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<td></td>
<td>0.00</td>
<td>0.02</td>
<td>0.01</td>
<td>0.07</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>NPA/AA</td>
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<td></td>
<td>10.00</td>
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<td>10.62</td>
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<td>10.51</td>
<td>10.51</td>
<td>10.51</td>
</tr>
<tr>
<td>%CAA</td>
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<td>69.07</td>
<td>68.97</td>
<td>69.07</td>
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<td>68.97</td>
<td>69.07</td>
<td>69.07</td>
<td>69.07</td>
</tr>
<tr>
<td>MBS%</td>
<td>0.82</td>
<td></td>
<td>1.00</td>
<td>0.82</td>
<td>1.00</td>
<td>0.82</td>
<td>1.00</td>
<td>0.82</td>
<td>1.00</td>
<td>0.82</td>
<td>0.82</td>
<td>0.82</td>
</tr>
</tbody>
</table>

2007 Regression Results
A THIRD LOOK AT PUBLIC HOUSING IN SWEDEN: THE INFLUENCE OF OWNER DIRECTIVES

Timothy L. Wilson and Lars Lindbergh
Umeå School of Business and Economics
Umeå University
SE 901 87 Umeå, Sweden

ABSTRACT

Strategic directives play an important role in directing and communicating the purpose of both private and public Swedish companies. The directives usually state purpose of ownership, the role of the company and required returns. In particular, present directives in municipal housing are assumed to have been affected by a new act, the Public Municipal Housing Companies Act, passed by the Swedish Parliament in June 2010 and put into force in January 2011. Thus, Public Municipal Housing Companies (PMHCs) have operated at least two full years under the new Act. The Act states among other things, that PMHCs should run their operation on “businesslike principles”- commensurate with New Public Management (NPM). In this study we discuss some changes in owner directives over a decade for Public Municipal Housing Companies (PMHC) in Sweden. Preliminary results suggest that a subtle change in directives has occurred and adaptation to the new Act has taken place at this relatively early date.

INTRODUCTION

Previously, we had presented papers on Swedish housing at PEA Conferences (Lindbergh et al., 2003, 2002). These papers were outputs of an ongoing economic interest in municipal housing in Sweden and were subsequently published in journal form (Lindbergh et al., 2006, 2004). At the time of these publications, the case of Swedish public housing commanded special interest. That is, it had a significant position in overall housing stock, a fifty-year history of relative success, yet significantly functioned on a basis that was “different” from other European systems. Others had suggested that the combination of “social credibility, professional efficiency and solid finances” of individual organizations were associated with the success of the Swedish system. Both financial returns as affected by ongoing investments in properties, as well as the impact of tenant negotiations in Swedish public housing, were covered in these presentations. After over a decade of development, interest has returned to this sector. Specifically, in this paper strategic directives in public housing, i.e. the case of owner directives in Swedish public municipal housing companies, are described and discussed.

BACKGROUND

Swedish Public Housing

Sweden has a tradition of a well-developed housing policy, with a large share of subsidies channelled through a multitude of instruments (Turner, 1999). It never had a social housing sector in the traditional of the U.S. or southern European sense1. That is, it did not have a social rented sector (Priemus and Boelhouwer, 1999). Instead, a non-profit rental sector was created after the Second World War. Under these circumstances, about one-sixth of all Swedish dwellings were co-operatively owned (Bengtsson, 1999). Most of the non-profit sector is organised by means of municipally owned limited companies or foundations and the municipalities played the biggest role in managing the sector (Turner, 1999; Priemus and Boelhouwer, 1999). The municipal companies, however, are owned by the municipalities and have a moral and political obligation to cater for all types of households (Turner, 1999). Thus, the goal of Swedish policy has been to provide shelter at a reasonable cost within the framework of an often time speculative market system (Bengtsson, 1999).

From this base, beginning in 1950 almost all municipalities set up their own independent housing companies. These companies were non-profit organisations 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 organisations 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 to this area that some concerns were addressed (Turner and Whitehead, 2002; Turner, 1999). 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.
General interest within the sector has continued. Lindbergh et al (2006, 2004) studied both financial returns as affected by ongoing investments in properties as well as the impact of tenant negotiations in the system. One general lesson drawn from that analysis was that expenditures on some items in the cost structure appeared to have an “investment” nature in operations (Lindbergh et al, 2004). That is, they have positive associations with increased revenue generation, operating profitability, and/or asset valuation. In particular, it was thought that property upkeep expenses not only were associated with higher revenue generation, but the long-term viability of the system. It was surmised that management had a positive role in the efficiency of this system and was associated with the way in which costs were controlled, properties maintained and rents set. Further, results suggested that negotiated rents produced operating profits that kept pace with revenues over that time period of study. In a subsequent study of the negotiation process between housing management and the rental union, there was impressive convergence – well placed respondents from both sides each told the same story and came to pretty much the same conclusion (Lindbergh et al, 2006). In other words, both parties tended to negotiate with the welfare of the system in mind, which has sustained the system in a customer oriented direction. These results appeared to be especially relevant (or perhaps should have been) to the interests of a wide range of local governments where public housing was of concern.

Lind and Muyingo (2012) looked at maintenance in housing. In that article they especially underlined the importance of adapting maintenance planning to the specific characteristics of the real estate sector. Unique and complex objects, with a strong interaction with the environment, made it almost impossible to predict the degradation process and the lifetime of different components. Economic changes also affected what is rational to do with a specific building. This meant that a flexible planning system had to be built up, where continuous adjustment of the plans was an integrated part of the system. The paper provided some substantiation for the earlier work of Lindbergh et al (2004) that indicated certain expenses were profit drivers in public housing. Azasu (2012) conducted a survey of reward management practices in the Swedish real estate sector. 62% of 93 the respondents were from the municipal housing segment. On the one hand, according to the respondents, the most important determinants of reward were the individual worker’s performance, comparisons with other companies, as well as the company’s financial position. On the other, the majority of the firms that did not adopt any variable pay plan were companies owned by the municipalities. Due to its present emphasis, it is not surprising that a study of corporate social responsibility in the sector has been conducted. Blomé (2012) considered the research question of whether corporate social responsibility in housing management was profitable.

The short answer was yes. The paper evaluated corporate social responsibility (CSR) in the context of real estate management. Different operation cost indicators were identified and related to the estates’ social condition. The results indicated that CSR led to approximately 4.5 percent lower annual operating and maintenance costs, which improved the company’s profitability, especially if higher maintenance standards made higher rents possible. Other advantages were improved goodwill, which led to new business opportunities. On the other hand, activities such as slum lord(ing) have also received attention. Rather surprisingly, examples were found (Lind and Blomé, 2012). For several reasons the tenants in the area under study did not seek retribution, which indicates that a more active role for the local authorities is necessary. It was argued that the tenants stayed even though the rent was higher and the quality was lower than in neighboring areas because of a combination of three factors: rents were paid by different forms of welfare payments; lack of alternatives because of queues to other areas; and because some tenants saw an advantage in the “no-question” asked policy that the slumlord followed. It is further argued that the property owner found this slum-strategy profitable either because he hoped to find a “bigger fool” to sell to and/or because the decision makers in the company had not invested their own money. Both tenants and investors were, in the end, losers, but not the company managers. Palm (2011, 2013) has studied Swedish real estate companies. In the 2011 study, content analysis of 25 companies’ annual reports was used to ascertain customer orientation over a five year period. It was concluded that the majority of the companies tended to be customer oriented, but there was little change over the five year period. The 2013 study concerned the strategic approaches of companies. Interviews with executives suggested that regardless of organizational structure, self-assessment suggested they were satisfied with their results.

New Public Management (NPM)
There tends to be a relationship between New Public Management (NPM) and housing considerations. Walker (2001), in fact, used NPM as a tool to examine the future of housing in Great Britain. The paper described how public or municipal housing in England and Wales was being abolished and transferred into the housing association sector. Analysis of the transfer process indicated that externalization was driven by political and ideological approaches to public housing in addition to NPM dimensions, but that as local authorities transfer their stock into the housing association sector they are also likely to develop into similarly “managerialised” organizations. The conclusion was that the NPM framework was demonstrated to need further development whereas systematic research was required on management reform in social housing provision. Nevertheless, the lesson to emerge on how to abolish public housing suggested the policy formula: starve it of resources, create a hostile environment and wait, in the goodness of
time it will abolish itself!

If there is universal agreement on anything concerned with New Public Management (NPM), it is not new (cf. Erlingsdottir et al, 2013). The history of NPM associates it with a global movement produced a debate in the 80s about what could be done to make the public sector more efficient. A statement such as the public sector was lacking in efficiency, or how more value could be obtained for tax money, focused attention on how the public sector was organized. This debate produced a change that became known as New Public Management (cf. Hood, 1995, 1991). Hood (1991, pp.4-5) suggested there are seven main “doctrinal components” to NPM, including: hands-on professional management; explicit standards/measures; emphasis on output controls; disaggregation of units; greater competition; stress on private-sector style management practices; stress on greater discipline and economy. Hughes (1994, pp. 69-73) identified four changes which “constitute the managerial programme”: a focus on outputs; alterations to administrative inputs, such as hiring staff by contracts; changes to the scope of government, including privatisation and contracting-out; finally, changing accountability relationships with politicians and the public, as managers become more responsible for results (which overlaps with the first change, i.e. focus on outputs). Similarly, Farnham and Horton (1996, p. 42) identified three main managerial thrusts throughout the public services during the 1980s, including: “tighter control of spending; movement to decentralise managerial responsibilities and functions, resulting in more devolved budgetary systems, giving more responsibility to line managers, more emphasis on organisational responsiveness to “consumer and client” interests” ….

This development has been seen as a market based ideology, which focused on financial control with the intention to make the public sector more businesslike. Inherent in the approach was that efficiency should be stimulated. Pollitt (1990, pp. 10-11) argued that that progress would be characterized by importation from the private sector. New Zealand was among the first to begin performance management and/or budgeting in the late 1980s, followed in the early to mid-1990s by Canada, Denmark, the Netherlands, Sweden, the UK and the US (OECD, 2004, 60). New Zealand’s initial performance was part of a broad reform agenda, which began with a new government and a financial crisis (OECD, 2004, 62). Sweden’s experience in this area possibly started with the institution of manage-by-objectives with principles in the State school system in 1992 (cf. Lindberg and Wilson, 2011). Subsequently, and before the excursion into housing, attempts were made to improve healthcare and developmental aid (cf. Krohwinkel-Karlsson and Sjögren, 2008).

Naturally, there has been concern about the viability of NPM (Diefenbach, 2009, Hood, 2004, 2000; Lapsley, 2009). Clark (2010), in addressing this situation, suggested the we have participated 30 years in these programs of permanent revolution that seek to make such institutions efficient, effective, economic, accountable, transparent, productive, innovative, entrepreneurial, relevant . . . and, almost certainly, “world class”. “Businesslike” has typically meant adopting corporate conceptions of calculation, management and performance – performance both in the sense of an intensified concern with competitive performance management and in the sense of looking like a corporate entity (possessing vision statements, missions, CEOs, culture change programs and a brand, for example). There was a reminder that public services are not always consumed voluntarily. He asserted that we must consider what sort of public we should be imagining and trying to summon in our work. What types of interest, need and desire should we be trying to bring into visibility and turn into the focus of public action? What sort of ethics should govern our engagement with the public(s) we encounter? And, last but not least, what are we going to do about our ambivalence about the public? In short, NPM is not a recipe, but a consideration.

On the other hand, some individuals suggest NPM has had a positive impact in terms of its “dominant role in the reforms of the public sector reform in the 1980s and 1990s” (Lapsley 1999, p. 201), which has spread internationally (OECD, 2005; Guthrie et al. 1999; Hood 2000; Lapsley 2009). Present pessimism aside, Levy (2010) suggests the death of NPM is premature and overstated. That is, NPM is arguably as much a casualty of the present global economic crisis as are the markets and market mechanisms which underpin it. He saw four possible scenarios in recovery – 1.) status quo, 2.) intensification, 3.) rejection and 4.) a combination of 1.) and 3.), i.e., reinvention. That is, a refocusing and commitment to better management. Of these, the combination reinvention seems most likely, i.e., NPM will be back, but in a changed form.

Public Municipal Housing Companies Act

The Swedish regulation on public utility municipal housing companies that entered into force on 1 January 2011 meant that existing ownership directives needed to be reviewed so that they were harmonized with the new framework. Each municipality had a responsibility for housing supply, which most people have taken by owning a public utility housing stock-company. Provisions indicated that in order to carry out tasks in a “good” way, each participating municipality had to clearly spell out what it wanted to accomplish, what benefit it expected to bring to the municipality and its inhabitants, as well as frames and conditions for business. Also, the articles of association might need to be changed (Owner Directives, 2011). Particular items that needed to be addressed for 2011 include:

- General standpoints (Övergripande frågeställningar),
- Business idea (Ägaridé),
- Operation/Development (Verksamhet/utveckling),

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• Financial (Ekonomisk/finansiella),
• Coordination/Processes (Samordning/process),
• Customer/Market (Kund/marknad),
• Democracy (Demokrati) and
• Ecological Standpoints (Ekologiska utgångspunkter).

These items represented an increase from a similar list of five from 2003.

The Swedish National Board of Housing, Building and Planning (Boverket, 2011) has described the law that is addressed and discusses some changes. These changes are interesting and help in explaining some significance of observations. They are, however, somewhat outside the thread of this paper so they are reproduced in Appendix 1. Further, to assist in appreciation of the changes, however, Appendix 2 is also included in this paper, which compares the format available for preparation of the 2004 perspectives reviewed here (Owner Management, 2003) with material available for the 2013 preparation (Owner Directive, 2011).

METHOD

The experimental design in this study was constructed to identify the early perspectives of operation in housing management and their relationship with the more "businesslike" ones subsequent to the legislation. Both a qualitative and a quantitative approach were used in the study. Data for the qualitative portion of the study were taken from Owner’s Directives for each of the companies involved in the study. This instrument is perhaps peculiar to Swedish management and thus unfamiliar to the general readership of this journal. Thus, the following definition is translated from Ägardirektiv till allmännyttiga kommunala bostadsbolag - en handledning (English: Owner directive for Public Housing Companies - a guide), page 11:

“The Owner’s Directive is different from the Articles of Association by being a voluntary, formal control instrument (emphasis added). The company does not need to have an Owner’s Directive, but if there are ownership directives, they are legally binding. (That is), the owner directives become binding when they are decided upon at the municipal general meeting. (In general), decisions of the general meeting are thus the only formal approach to governance. (The availability of the Owner’s Directive) creates a transparency in the governance of the company. The Owner’s Directive may be generic and is then valid until further notice, but can always be changed by the owner. Also, special ownership directives relating to a specific issue can be issued”.

Data on individual items were quantitatively compared for 2013 (the latest year material was available) with 2004 using commercially available NVivo software. Twenty companies, 37 percent of the complete, usable sets, were randomly selected for analysis. The following nodes-concepts-perspectives were used:

• The Owners’ Idea (basically the mission of the organization),
• Operation/Development including Governance (Swedish word styrning) and Control (sub nodes; owner directive function, auditing, governance),
• Social,
• Ecological (sub nodes: environment, customers and markets),
• Financial (sub nodes: return on equity, collateral, solvency, and dividends),
• Coordination and Dialogue including Democracy.

(Note that there is not commonality in the coverage of the two documents, so selection of material was organized by the 2011 perspectives as shown in Appendix 2).

OBSERVATIONS

General Nature of the Documents
Length considerations preclude repetition of material covered in each of the ODs surveyed in this study. It is instructive, however, to illustrate the nature of coverage in these documents. The following is an example of how a Public Housing Company, AB Stångåstaden, refers to their owner directive in their Annual Report in 2009, pages 17 and 19:

“Owner directives and objectives (p. 17)

The Municipality of Linköping desires to create the best possible conditions to enable a new society to grow. Stångåstaden is an important tool to create attractive residential environments in the Municipality. The Municipal Council adopts the annual owner directives that govern the municipal companies.

The owner directive provides that Stångåstaden should act from a long-term perspective and on terms that accord with good business practices and do not interfere with competition, in order to assist the Municipality in its responsibility for the local supply of housing. The directive further provides that the company should improve the infrastructure and environmental quality of housing in Linköping, and take responsibility for ensuring that housing is available for persons with a weak position on the housing market.

The financial objectives that the Municipality of Linköping formulated for Stångåstaden are expressed in the form of measures of return and equity-to-assets ratio. The financial objectives are expressed in terms of operational requirements and performance objectives and/or action plans. Based on the owner directives and these objectives, Stångåstaden prepares an annual business plan and a strategic plan with overarching...
objectives in order to guide operations so that the owner’s overarching operational requirements and financial requirements can be achieved . . .”

“AB Stångåstaden should (p. 19):

- Be an active player on the housing market through construction of new premises, expansions, and renovations, as well as the acquisition and sale of property.
- By its own development, and in close cooperation with researchers, monitor the environmental and sustainability adaptation of its operations and services.
- Take responsibility for ensuring that housing is available for persons with a weak position on the housing market
- Significantly reduce the ownership of commercial space and property.
- Have a reported equity-to-assets ratio of 20–25 percent
- Have an adjusted equity-to-assets ratio of 35–60 percent
- Have a return on adjusted equity of 4–8 percent
- Be able to stimulate the construction of all forms of housing, and contribute to technical development in the real estate industry.”

Length of Documents
A measure of document length is among the most basic considerations that might be used in comparing the documents pre- compared to post-regulation. That is, given that several new areas were included in the 2010 mandate, length would be expected to increase. Results are given in Table 1. Although variations existed, documents tended to be short initially – three pages or so (2,66). Upon revision they became slightly longer (3,75). Consequently, if the housing companies were not thinking about becoming more businesslike, they appeared to be writing more as reflecting upon the new legislation.

*** Table 1 goes about here. ***

AB SigtunaHem provides an extreme example of growth as it grew from three to nine pages. That is, the later directive developed significantly in most areas and also including some not often mentioned areas; the aspect of children (Sw. barnperspektiv), the PHC as an employer, IT-services, and benefits to board members (Sw. ersättnings till styrelsen).

The latter directive also mentions the change from the “Self-cost principle” (Sw. Jälvkostnadsprincipen) to the “Business-like principle” (Sw. Affärsmässiga principer). Both ODs emphasized the need to produce new apartments. OD2013 stated a goal of 33% rental flats, 33% condominiums (Sw. bostadrätter, you own a “right” or “a part of a building”), and 33% owned flats (Sw. ägarlägenheter, you own an apartment) until a balance has been reached in the municipality, including 3D ownership (fastighetsbildning). Thus, although there was a difference for the level of incorporation between the ODs of the two periods, length changes were manifested in this case not only by modifications introduced by the legislation, but also changes in apparent plans.

Of course there were exceptions. Hebygårdar AB’s OD decreased in size from 7 pages to 2,5 primarily because the earlier report was for the parent company. Thus, there is a problem in comparing these two documents. Interestingly, it is the OD for Heby fastigheter AB (the earlier) that mostly resembles an average of studied ODs in terms of structure and content. For instance, the OD2004 lacked details for example with regard to specific aims and return. AB Sollentunahem appeared to change little at all in terms of length. Its early OD was five pages, and the later one was 5,5 pages. Even though the current version is the 8th version it resembles the very first version. In fact, the titles of the first 16 sections are the same as the first and only two have been added. There were some trade-offs. The earlier directive states that the PHC shall operate with a “social profile”. This has been toned down in the later directive. Instead a note has been added in the later directive stating that the PHC should own wind turbines and make use of the produced power. The later directive also includes some words on being environmentally friendly. Notably, the writing on “business-like principles” remained the same, but simultaneously referring to what is valid for public companies. “Transparency and control” has also been developed and provided somewhat more specific details with regard to communication and reports.

Content and Categories
Even more so than length, documents tended to more specifically address issues. That is, earlier ODs tended to be general and basic. Interestingly, even before the 2010 Act, companies had included material that could be related to the material in the act – although not specifically under the same categories as shown in Appendix 2. In other words, the tendency to act “businesslike” predated the change. Nevertheless, subsequent ODs, which now address the 2010 mandate, tended to be more focused within the points they had to address. There is no doubt, however, that the legislation has had an impact on municipal housings’ Owner Directives.

For the sample of 20 firms citations increased nearly 50 percent for the time period 2004 to 2013 (See Table 1. Sum = 252/169 = 1.49), which was statistically significant at the 0.000 level. The two individual categories in which increases were statistically significant at the same level were financial and operations/development citations. There was an increase of 77 percent (53/30) in financial citations in the sample for the 2013-2004 time span. Interestingly, whereas 25 percent of the sample said nothing about their financial situation in 2004, every company had something to say about it in 2013. The OD for AB Stångåstaden was very quantitative in its
have a reported equity-to-assets ratio of 20–25 percent;  
• Have an adjusted equity-to-assets ratio of 35–60 percent;  
• Have a return on adjusted equity of 4–8 percent.

Operations/development actually had a greater degree of change over the time span, 100 percent (44/22), but tended to be more qualitative than the financial coverage, i.e., for AB Stångåstaden  
• Significantly reduce the ownership of commercial space and property.

Although marginally significant statistically (p = 0.008) “Social” and “Ecological” each produced an increased coverage of over 100 percent (26/12 = 2.17). In looking at appendix 2, one sees that these two areas were not addressed previously. Thus, one impact of the 2010 legislation was to promote these two areas as areas of business interest. It must be recognized, however, that these two areas rose significantly because they were growing from a low base. In 2004 half the municipal companies had nothing to say about their social perspective; likewise in 2004 11/20 organizations said nothing about their ecological concerns. Our example of AB Stångåstaden had this to say about its social position:  
• Take responsibility for ensuring that housing is available for persons with a weak position on the housing market, and  
• Be able to stimulate the construction of all forms of housing, and contribute to technical development in the real estate industry, and this to say about ecology:  
• By its own development, and in close cooperation with researchers, monitor the environmental and sustainability adaptation of its operations and services.

Perhaps more appropriately associated with becoming more “business-like” are the observations made with regard to the financial perspectives.

Toward the lower end of the scale in magnitude of change in the sample were “owner idea” and “coordination and dialogue, including some of democracy”. The magnitude of these changes was not unanticipated because they formed the bedrock upon which the organizations were founded. That is, they expressed “this is what we want to do” and “this is how we will do it”. Owner idea perspectives increased 24 percent (46/37), whereas coordination, etc. although mentioned frequently barely changed at all (57/56). Going back again to the AB Stångåstaden example, the company states as its OD as its owner idea:  
• The Municipality of Linköping desires to create the best possible conditions to enable a new society to grow.  
• The owner directive provides that Stångåstaden should act from a long-term perspective and on terms that accord with good business practices and do not interfere with competition, in order to assist the Municipality in its responsibility for the local supply of housing.

With regard to coordination and dialogue, including some of democracy, they wrote:  
• Based on the owner directives and these objectives, Stångåstaden prepares an annual business plan and a strategic plan with overarching objectives in order to guide operations so that the owner’s overarching operational requirements and financial requirements can be achieved.

Put another way, Linköping put together AB Stångåstaden so that they could provide society-friendly, growth-oriented housing in its municipality. The approach would be long term in accord with good business practices and guided by both strategic and annual plans.

DISCUSSION

This paper extends two lines of thought with regard to Swedish municipal housing (SMH). That is, it picks up on a series of papers from authors interested in characterizing SMH with regard to operating processes (cf. Azasu, 2012; Blomé, 2012; Lind and Blomé, 2012; Lind and Muyingo, 2012; Lindbergh et al, 2006, 2004; Turner and Whitehead, 2002; Bengtsson, 1999; Priemus and Boelhouwer, 1999; Turner, 1999). The interest evolves from a combination of “social credibility, professional efficiency and solid finances” associated with the Swedish system (Bengtsson, 1999) not generally seen elsewhere. Consequently, there has been some interest in the financial situation of this sector. Whereas Lindbergh et al (2006, 2004) seemed to indicate that prudent investments were made in sustaining the value of the asset base, Turner (1999) suggested earlier that there were elements of financial uncertainties in the Swedish system. The law on public utility municipal housing companies implemented on 1 January 2011 seemingly suggested that there was cause for concern. With regard to the present work, the premise is made that developments would first show themselves in Owner Directives (ODs). The intent has been to determine how operation on “business-like principles” in the Swedish system is being implemented as is apparent changes in company ODs.

Indeed, changes were observed when comparing 2013 directives with developed earlier (2004 base). The present study suggests that among the companies included in this sample, organizations have seriously addressed the 2010 mandate as far as the OD’s content goes. That is, they have proceeded to express themselves in a manner consistent with “more businesslike” approaches. It is suggested that one change in the ODs is that they have become more strategic. For instance, one area of significant change is in operations and development (2.0/1). If one examines the nature of the latest perspectives under that topic, significant strategic items are seen, i.e.,
What shall the housing company offer with regard to apartments, areas, type of accommodation and quality in order to attract different tenants, and contribute to diversity and freedom of choice?

Shall the company, in addition to providing homes for all, pay particular attention to special target groups, such as students and elderly?

Should the company grow, shrink or keep going as usual?

In what timeframe and in what way shall any changes be implemented?

Shall the company own real estate in all residential areas, or only in some?

These may be compared with the earlier model that appeared more tactical and contained such items as

- On a commercial basis build and manage housing adapted to specific needs and target groups such as students, families, seniors, and businesses.
- The company shall actively develop safe and secure environments and neighborhood for the residents.
- Active implementation of the municipal housing’s social program and commitment with focus on active inclusion and prevent segregation.

It is interesting that the largest differences in ODs came in the “softer” areas of business, i.e., ecological (2.17/1) and social (2.17/1) considerations. It has already been noted that part of this increase comes from the fact that each of these two had the lowest number of citations (12) in the base year. In fact, in 2004 10 companies said nothing concerning their social goals and 11 nothing about the ecology. In the ensuing decade, however, there has been greater appreciation in Sweden for the fact that companies that tend to consider their environments tend to do well financially (cf. MISTRA, 2012). Evidently this sector is following that model (cf. Blomé, 2012); at any rate, the number of companies ignoring these factors has fallen to three in each case.

Observations also incorporate the concepts of new public management (NPM) as now applied to Swedish Municipal Housing (SMH), i.e., the idea of operating a governmental nonprofit in a businesslike manner (cf. Hood, 1995, 1991). Consequently, both the OD’s financial (1.77/1) and business ideas (1.24/1) tended to be expanded. In the model OD, AB Stångästaden (2009), there were very, very specific goals expressed:

- Have a reported equity-to-assets ratio of 20–25 percent;
- Have an adjusted equity-to-assets ratio of 35–60 percent;
- Have a return on adjusted equity of 4–8 percent.

It is to be noted in this case the company was not only becoming more businesslike, it was becoming more quantitative. Thus, each year stakeholders could check returns versus the internal standards set for each. Failure to attain these goals would undoubtedly result in the very businesslike process of holding management responsible for its actions. There is some indication that companies may have been moving in that direction as early as 2004 as suggested by their ODs. This apparently follows from attitudes at the time. That is, despite the fact that Palm’s (2011) study was in another sector of Swedish housing (real estate), it found that as early as 2004 some companies were espousing a customer orientation. A similar observation was made in this study. Put another way, certain organizations were expressing their business orientation six to 10 years before the regulation was promulgated.

Curiously, this experiment in NPM is not Sweden’s first. Nearly 20 years ago (1994) it was decided to implement Management by Objectives (MBO) in Swedish upper secondary schools (Lindberg and Wilson, 2011). The MBO model in Sweden was constructed to promote effectiveness, decentralisation, long term commitments and accountability in the governmental administration. The local principal was charged with the implementation in his/her schools. That study concluded that the impact on student performance appeared to be basically neutral. That is, practice neither improved nor lowered performance in the areas of the study – ratings, throughput and admission. Nevertheless, it was hypothesized that continued use would be improved by allowing flexibility in application, which appeared to be the direction encouraged by thinking at the time of the study. It is not clear what has happened in Swedish secondary schools, but there may have been a lesson learned in application of Swedish NPM – the application in the housing case does appear to have an element of flexibility in its approach, which perhaps bodes well for its future. On the other hand, results may produce an element of uniformity in operations and financial performance.

It is customary in concluding papers to reflect on future work. That custom is followed here; there is still work to be done in this sector. It is still early to ascertain the actual modification of business practice. In the parlance of street vernacular, the outputs of the ODs represent companies’ ability to “talk the talk”. It remains to be seen if they really have learned to operate more like businesses. In other words, have they learned to “walk the walk”? If that is the case, it is expected that comparisons within companies might show changes in compliance with the “commercial principles with the normal rate of return”.

Although there is only two year’s information with which to work, it is expected that comparisons within companies might show changes in compliance with the “commercial principles with the normal rate of return” i.e., the limitation of dividend restrictions contained in the so-called Algbolagen which has been replaced by a limitation of the value transfers.
from municipal housing companies. Furthermore, in will be interesting to note the reaction to the entry that a municipal housing company’s profits can be transferred from the company to the municipality if they are made in order to finance the measures in the framework of the municipality's housing supply. Finally, there should be some news on the new security rule against excessive rent increases was introduced — the so-called “step rule.”

Finally, in will be interesting to note the reaction to the entry that a municipal housing company’s profits can be transferred from the company to the municipality if they are made in order to finance the measures in the framework of the municipality's housing supply. Along these lines, there should be some news on the new security rule against excessive rent increases was introduced — the so-called “step rule.”

CONCLUSIONS

This paper has been a study in what has been seen to change in ODs as a consequence of a change in regulation. This is the first attempt to determine the impact that complying with “businesslike principles” has on operations in Swedish housing, which tends to be a model for other countries. The study suggests that among the companies included in this sample, organizations have seriously addressed the 2010 mandate as far as the OD’s content goes. That is, they have learned to “talk the talk”. Insofar as Sweden might be a model for other countries interested in extending their efforts in managing public housing, observations here provide some insights into possible results. The next step, i.e., future research is likely to be concerned with improved and/or enhanced financial returns in operations as a consequence of the regulation.

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Owner Management – from a Municipality Perspective, (2003, in Swedish), Section 5.3 Direktiv Bostadsbolag” (Directives Housing Companies), Ägarstyrning – utifrån ett kommunalt ändamål, Svenska kommunförbundet, pp. 38-41.


ENDNOTES

1. Basically true, but usually a small proportion of the available flats within a PMHC are categorized as “social housing”.

2. Recall public housing in England and Wales is social housing, so shifting from municipalities to housing authorities represented a shift toward the Swedish system.

3. The translation is as close to literal as possible while remaining readable in English. Transition material that has been added to the original Swedish is enclosed in parentheses.

4. Note the subtle change in terminology, which may initially be confusing because of the similarity in terms. Ownership directives are the elements comprising the Owner’s Directives.

5. There were some problems finding consistencies in reporting. That is, although there were 137 municipal housing companies in Sweden at the time of this study, only 100 were in existence in comparable form for an earlier study (Lindbergh et al, 2004, 2006) and were made available for this research. Of the 100, 60 ODs were available for both 2004 and 2013. Of these 54 were in a format, e.g., that could be imported into NVivo. There was also some difficulty in getting comparisons between the years 2004 and 2013, so this list is modified from the listing of the regulation under the PMHC Act described previously. Some issues related to, for example, “customer/ market” were now considered within the perspective “operation/ development” and other issues for example “social” and “ecological” were only briefly mentioned in the previous definition of “operation/ development” were now broken out into separate perspectives.

6. http://www.stangastaden.se/omoss/Ekonomi/Documents/Annual%20report%202009-%20English.pdf (Downloaded 2/25/2014). Note that this material is included in the paper because it was 1.) available in English and 2.) did a particularly good job in providing clear material for citation.
Appendix 1 – Swedish National Board of Housing, Building and Planning description of the law and its changes (Boverket, 2011)

Since 1 January 2011, there is a new law (SFS 2010: 879) on public utility municipal housing companies. The intent of the law is to clarify the definition of companies but also set new demands on how business is conducted and the transfers that can be made to the owner, i.e. the municipality:

- The main task of a municipal housing company shall be to manage property with flats, promote housing in a municipality and offer tenants influence\(^1\).
- The most important change starting in 2011 is that companies should operate according to commercial principles with the normal rate of return.
- Furthermore, the limitation of dividend restrictions contained in the so-called Allbolagen is replaced by a limitation of the value transfers from municipal housing companies.
- A municipal housing company’s profits can be transferred from the company to the municipality if they are made in order to finance the measures in the framework of the municipality's housing supply.
- They can, among other things be used in promoting integration and social cohesion, or measures to meet the need for housing for persons for whom the municipality has a particular responsibility.

Changes include:

**Rental Provisions**

- By the end of the year, there were also additional changes introduced, changes in the rent laws, i.e. 55 and 55e sections in Chapter 12 land code.
- The change is closely related to the new law on non-profit municipal housing companies and defines the public-sector role in rental rate change:
- Rents negotiated collectively should be “normative” regardless of who is renting. Prior to 2011 if there was a dispute over the rent, the Rental Board used the rental scheme in the public municipal housing companies for a similar apartment in their jurisdiction. This interpretation meant in practice that the public-sector rents became normative for lease negotiations. Starting in 2011, it meant as well that rents that a Tenant Association negotiated would become normative in private property disputes.
- Furthermore, a new security rule against excessive rent increases was introduced — the so-called “step rule” (Sw. trappningsregeln). The rule is intended to mitigate the impact of excessive rent increases in case the new rent would be significantly higher in comparison to the old rent. (It remains to be seen what the Rental Board will judge to be a significantly higher rent but if it is approaching 10 percent, it is probably a substantial increase.
- And if there is a substantial increase in rent the Board can decide if it is a gradual escalation. Such an escalation could probably not last more than ten years, but even here the position of the Boards that will be crucial in the rental).

**Follow-up**

- The agency has, inter alia, to follow developments after these changes. It is worth noting that it is only the fiscal year that starts after January 1, 2011 that the new law on non-profit municipal housing companies takes effect.
- This restriction allows effects of the changes to be evaluated only after the end of 2011.
- On the other hand, the profit directive changes during the year.
- Changes relating to tenancy legislation, however, have been enabled during 2011.

**Role through Ownership Directives**

- With regard to local government’s role through the Ownership Directives (ODs), the agency previously examined how local authorities used the ownership directives to control the public utility housing

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\(^1\) “Influence” is the best word we could think of in the translation. It is supposed to mean that tenants should have a “real opportunity to affect the PHC and living conditions”. It is a part of the perspective “Social”, i.e., should a playground be built in an area? Should the PHC work more with environmental issues?, etc.
companies and a major report was published in the December 2006: a study of non-profit housing companies as municipal instruments. (Thus, in instances where local authorities have seen a need for a new owner's directive, as applicable with effect from 2011, so there is an interest to see how these are different from the previous. There are, for example, reasons to expect that the responsibility for housing supply in the municipality will be distilled and not be on the public utility housing companies. One can also ask whether there will be social considerations in the directive which may have ownership of that certain measures must be taken as the alternative that nothing is done, means that the company faced increased costs. There is also reason to see how well any older owner directive complies with the law).

Continuous Monitoring
- The agency follows public-sector development through the annual housing market survey. That survey shows, among other things, the extent to which non-profit housing companies contribute housing for social purposes, current housing sales and construction of senior housing. The latest results are reported in the “housing market in 2011-2012” and published in the month of June 2011.

Public Housing Companies in a historical perspective
- Swedish public housing reflects positively in relation to counterparts in other parts of Europe. It primarily addresses only certain groups, such as low-income households, but is open to all. It is owned by the municipalities.
- The history of this policy is addressed in “the municipal public sector history”, which was produced on behalf of the State investigation into public-sector conditions 2008.
- The same year, the Swedish authorities also released the report “the usefulness of public housing”.

GENDER DIFFERENCES IN HOUSEWORK AND WAGES

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ABSTRACT

Gender differences in household responsibilities are often considered to result in gender differences in labor market outcomes. The direct effect of housework on wages has been given increasing attention in recent decades. Using the most recent panel data from the Panel Study of Income Dynamics, we confirm the findings in most of the literature that female workers’ wages are negatively correlated with their household responsibilities, while the effects of housework on male workers are insignificant. The relationships observed remain significant when we control for possible model misspecification, individual fixed effects, and random effects.

INTRODUCTION

Persistent difference in pay according to gender is always a serious public policy concern. To understand why such gaps persist, this paper examines one possible reason: the distribution of housework. While there has been much research on the indirect effects of household work on wages through human capital characteristics, few studies have investigated the direct effect of housework on wages. In this paper, we look at how household activities directly influence wages for male and female workers. Based on previous research, economists have predicted a negative correlation between housework and wages, and more importantly, the inverse relation is only significant for female workers and insignificant for men.

The earliest formal model directly linking home production with wages proposed by Gary Becker (1985) is an effort model that assumes individual effort is limited and an increase in the effort in housework necessarily reduces the effort for market work, which is positively correlated with wages. Thus the more time individuals devoted to housework, the less time and energy they have on their career development. Victor Fuchs (1988) found that the jobs women have taken are more likely to be located in residential areas, more likely to afford part-time work opportunities, and in general more compatible with traditional primary roles. After examining the direct link between housework and wages, Hersch and Stratton (1997) concluded that the direct negative relationship between housework and wages exists for both men and women, but only the evidence for female workers is conclusive, even after controlling for individual fixed effects.

MODEL SPECIFICATION

To answer the question of how household activities affect wages, we consider a standard wage specification and incorporate the housework time variable.

\[
\ln w_{it} = \beta_0 + \beta_1 hwrk_{it} + \beta_2 educ_{it} + \beta_3 tenure_{it} + \beta_4 tenuresqr_{it} + \beta_5 age_{it} + \beta_6 agesqr_{it} + \beta_7 kids18_{it} + \beta_8 kids2_{it} + \beta_9 union_{it} + \beta_{10} south_{it} + \beta_{11} race_{it} + \beta_{12} spouse_{it} + u_{it}
\]

where \( u_{it} = \alpha_{it} + \epsilon_{it} \) (1)

\( w_{it} \) is the real hourly wage of individual household \( i \) at time \( t \); hwrk\(_{it}\) is time spent on household activities; and \( u_{it} \) is the error term, which has two components: \( \alpha_{it} \), the unobserved individual household characteristics that affect wages in a time invariant manner, and \( \epsilon_{it} \), the normally distributed random error. The standard specification of the model in this paper, as shown in (1), is a regression of the log of hourly real wage on housework, education, tenure and its square, age and its square, the number of children in the household under 18 and under 2, spouse income and its square, spouse housework time and dummy variables for union membership, race and residence in the South. Year dummy variables are also included but not shown in the specification. This wage equation is estimated for both men and women.

The coefficient on housework time (\( \beta_1 \)) is our primary interest. If housework time has a direct negative effect on wages, as suggested by Becker's model (1985), we expect \( \beta_1 < 0 \). The OLS estimates of \( \beta_1 \) will be biased if housework is
correlated with the error term, $u_i$. The expression of the error term suggests two possible sources for the existence of a spurious negative correlation. First, housework and wage may be jointly determined. Individuals with higher wages face higher opportunity costs for the time on housework, so they would decrease their home production. Then housework will appear to have a more negative impact on wages than it actually does, leading to a biased down OLS estimates of $\beta_1$. Second, the correlation between housework and the error term could be attributed to the individual fixed effects component $a_i$. For example, $a_i$ can be a measure of the individual's innate personality. Some individuals with more aggressive personalities and more focused minds will be more productive for a given amount and intensity of work. If those workers participate more in market production and spend less time on housework, then $\alpha_i$ and housework time will be negatively correlated. Again, the OLS estimates of the coefficient on housework time will be biased down.

Hersch and Stratton (1997) addressed the simultaneity problem of the interdependence of housework and wages using instrumental variables. They found substantial confidence in the negative relation between wages and housework for women, but a lack of certainty on the relation for men. To tackle the unobserved heterogeneity due to individual-specific effects, our paper uses fixed effects and random effects estimates with clustered standard errors to account for heteroskedasticity and intra-group correlations to estimate the relationship between housework and wages.

DATA

The data set used in this paper comes from University of Michigan's Panel Study of Income Dynamics (PSID), surveyed annually since 1968 with information on a wide range of worker characteristics for a national sample of households. We especially value this database because it includes the housework time measurement and panel data that allows us to control for unobserved heterogeneity.

Our analysis uses data in eight years, 1993, 1994, 1995, 1999, 2001, 2003, 2007 and 2011. We restrict our sample to households with individuals earning positive hourly wage, not including zero, following the selection procedure in Hersch and Stratton (1997). We also exclude observations for people younger than 17 and older than 70. All monetary values are normalized to 2011 dollars using the Consumer Price Index. Since panel data requires observations for the same households over time, the sample consists of households with complete information in the eight time periods. Through the procedure, we choose 44 households from 1993 to 2011 and record their real hourly wages and labor market determinants (housework time, education, tenure, current region, age, union, etc.)

Descriptive statistics for the variables included in regressions are summarized in Table 1. Compared to the female workers in the sample, male workers on average have substantially more tenure, and the average hourly real wage of men, as expected, is also higher than that of women. On the other hand, the female workers in the sample dominate the men in housework time. This variable is measured as the response to the question, “About how much time do you spend on housework in average week? I mean time spent cooking, cleaning, and doing other work around the house.” In this sample, the housework time for women on average is more than two times that of men’s.

RESULTS

The three estimation methods, pooled OLS, fixed effects and random effects estimates, reveal a robust negative relation between wages and housework for wives. Fixed effects estimates reduce, but do not eliminate, the significance of this negative relation. For husbands, the relation is more tenuous since none of the estimations generates statistically significant negative coefficient for housework.

Ordinary Least Squares Results

Column 2 in Table 2 presents the estimates using pooled OLS with clustered standard errors for men and women. The magnitudes and signs of the estimated coefficients are consistent with those typically found in the literature. Wages increase with age and experience with the present employer at a decreasing rate. An individual with union membership or higher education earns more than their counterparts. Workers in the South and individuals of color earn less. The effects of children are not very significant in this sample, which is not surprising given that not many households in the sample have children less than 18 years old, not to mention children less than 2 years old. One interesting phenomenon is that though not statistically significant, the magnitude of the coefficients suggests that female parents with children less than 2 and less than 18 years old on average have lower wages than male parents. After having children, it is possible that wives increase their home production, mostly for childcare, so husbands tend to be more devoted to market production. For time dummies, an F test of their joint significance with a p-value greater 0.2 suggests that the effect of housework activities on wages in previous years in this sample does not differ much from that in the base year 2011 for both men and women.

Most importantly, for our variable of interest, the coefficient on housework is significantly negative for female workers, confirming the inverse relationship between housework and wages. A one-hour increase in the housework time per week decreases the wages by about 1.06 percent. For men, however, the negative relationship is not significant, suggesting no strong evidence supports the impact of housework on male workers.
Fixed Effects Results

If there was unobserved heterogeneity, the OLS estimates would be biased. The fixed effects estimates would be corrections to the pooled OLS estimates, informing us the magnitude and the direction of the bias. Fixed effects estimation gets rid of any time-invariant variables, which is the $\alpha_t$ term in the model specification (1), and we will obtain consistent estimates if the endogeneity comes from the individual-specific error component.

The coefficients obtained for fixed effects estimates with panel-robust standard errors are included in column 3. The model provides a within R-square value of 0.1608 and a significantly negative correlation between housework time and wages only for women. However, the magnitude of the coefficient on housework decreased compared to the pooled OLS estimates, representing a smaller effect when we controlled for individual-specific error. Other coefficients remained in similar magnitudes and same signs as in the pooled OLS estimates, except for those of the real hourly wage and the age of spouse, which are statistically insignificant. For men, there is no evidence of a significant effect of housework on wages.

To examine the significance of this negative correlation, we discuss one alternative specification that may explain the different observations of the significance of the negative relation between men and women. Our concern comes from the potential nonlinear relationship between housework and wage since it is possible that housework affects wage at a non-constant rate. Now the model specification becomes

$$\ln w_{it} = \beta_0 + \beta_1hwrk_{it} + \beta_2hwrksqr_{it} + \beta_3educ_{it} + \beta_4tenure_{it} + \beta_5tenuresq_{it} + \beta_6ages_{it} + \beta_7agesq_{it} + \beta_8kids1_{it} + \beta_9kids2_{it} + \beta_{10}union_{it} + \beta_{11}south_{it} + \beta_{12}race_{it} + \beta_{13}spousew_{it} + \beta_{14}spousehwrk_{it} + \beta_{15}spouseage_{it} + u_{it}$$

(3)

where $u_{it} = \epsilon_{it} + \delta_{it}$. (4)

If the wage-housework relationship is in general concave, men with less housework time could be biased down in the linear model estimation. Thus different starting points at the wage-housework relation might lead to different coefficient estimates. However, a t-test of the coefficient on the housework squared term suggests the squared housework term does not seem to be statistically significant for both men and women so this misspecification does not receive strong supporting evidence.

In conclusion, the fixed effects correct the OLS estimates that were biased upward and support the conclusion that increased housework affects wages negatively only for women, which provides evidence for the robustness of the findings of gender differences in the effect of housework on wages.

Random Effects Results

Suppose now that the individual-specific effect is uncorrelated with each explanatory variable in all time periods. Column 4 of Table 2 shows that there exists a highly significant negative result between housework and wages for female workers but the significance of the effect for men remains inconclusive. The Hausman test of the choice of fixed versus random effects estimates with non-clustered standard errors generates a relatively large p-value, suggesting the null hypothesis of both fixed and random effects estimates being consistent cannot be rejected. A failure to reject indicates that either the fixed and random effects estimates are very close so that the choice of which estimator to use does not matter, or there is not enough information in the data to provide precise coefficient estimates so that the sampling variation is too large to conclude significant differences of these two estimates. However, when using the Sargan-Hansen statistic on the comparison of the two estimates with clustered standard errors, the p-value becomes sufficiently small and we have evidence to believe the fixed effects model is more appropriate.

It is not surprising that the strong assumption of the random effects may not hold, especially for labor market data where there could be multiple omitted time-invariant factors that affect explanatory variables such as housework. The omitted ones could be non-labor income and the type of occupation. Thus the random effects model might generate inconsistent estimates given the sample data this paper uses.

CONCLUSIONS

The pooled cross-sectional, the fixed effects and the random effects estimations all suggest the existence of the negative effect of housework on wages for women in addition to the standard determinants of wages. This negative relationship is not simply a result of a correlation between housework time and unobserved individual characteristics. Rather, it is an indication of the direct effect housework has on women’s wages. The result for men, however, is less conclusive. A possible interpretation of this result is that employers discriminate against women who devote themselves to household responsibilities. Employers may provide less frequent promotion for women than men with similar human capital qualifications since household responsibilities prevent women from having equally flexible working schedules as men. Another important implication lies in the gender wage gap. Since including time spent on housework in the wage equation provides partial explanation of the income differences, policies on reallocating home production time
can make women more attractive in the labor market.

This paper also suggests a future research direction. One possible interesting direction to consider is the relationship between housework and wages if home production affects women's labor supply decision. The significantly negative housework-wage relation for women can discourage them from joining the job market in the first place. The use of binary choice models could be instrumental in modeling the choice of women entering the labor market or leaving depending on the housework distribution in the household. The negative correlation between housework and the labor supply decision of women is a direction worth exploring.
Table 1: Summaries for Variables in Wage Equations

<table>
<thead>
<tr>
<th></th>
<th>Obs</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
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<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real hourly wage (2011$)</td>
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<td>22.12</td>
<td>79.82</td>
<td>1.00</td>
<td>1076.09</td>
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<tr>
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<td>0.00</td>
<td>17.00</td>
</tr>
<tr>
<td>Tenure (months)</td>
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<td>294</td>
</tr>
<tr>
<td>Tenure Squared</td>
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<td>7533.74</td>
<td>0</td>
<td>86436</td>
</tr>
<tr>
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<td>8.30</td>
<td>22</td>
<td>64</td>
</tr>
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<td>1953.67</td>
<td>734.65</td>
<td>484</td>
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<tr>
<td>Union</td>
<td>351</td>
<td>0.19</td>
<td>0.40</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>South</td>
<td>352</td>
<td>0.45</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Hours of housework per week</td>
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<td>8.95</td>
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<td>60</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real hourly wage (2011$)</td>
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<td>35.51</td>
<td>145.41</td>
<td>1</td>
<td>1478.84</td>
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<td>Education</td>
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<td>12.16</td>
<td>1.53</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>Tenure (months)</td>
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<td>14.99</td>
<td>47.56</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>Tenure Squared</td>
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<td>1502.39</td>
<td>7533.74</td>
<td>0</td>
<td>86436</td>
</tr>
<tr>
<td>Age</td>
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<td>45.14</td>
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<td>69</td>
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<td>Age Squared</td>
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<td>0.49</td>
<td>0</td>
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<tr>
<td>South</td>
<td>352</td>
<td>0.45</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Hours of housework per week</td>
<td>352</td>
<td>7.15</td>
<td>6.12</td>
<td>0</td>
<td>30</td>
</tr>
</tbody>
</table>

Note: The data comes from the Panel Study of Income Dynamics. http://psidonline.isr.umich.edu
Table 2: Parameter Estimates for ln(wage) equations

<table>
<thead>
<tr>
<th></th>
<th>OLS Robust</th>
<th>Fixed Effects</th>
<th>Random Effects</th>
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</thead>
<tbody>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>291 (70) ***</td>
<td>267 (98.39) ***</td>
<td>264 (73.19) ***</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>2.18 (2.66)</td>
<td>2.37 (4.64)</td>
<td>2.09 (2.43)</td>
</tr>
<tr>
<td><strong>Tenure (months)</strong></td>
<td>0.64 (0.34)*</td>
<td>0.50 (0.20) **</td>
<td>0.55 (0.23) **</td>
</tr>
<tr>
<td><strong>Tenure Squared</strong></td>
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<td>-0.002 (0.0083)</td>
<td>-0.002 (0.0095) *</td>
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<td>1.05 (6.19)</td>
<td>10.48 (6.19)</td>
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<td><strong>Age Squared</strong></td>
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<td>0.006 (0.03)</td>
<td>0.006 (0.03)</td>
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<tr>
<td><strong>Kids less than 18</strong></td>
<td>-3.25 (3.76)</td>
<td>0.37 (4.89)</td>
<td>-1.41 (3.94)</td>
</tr>
<tr>
<td><strong>Kids less than 2</strong></td>
<td>-4.07 (13.29)</td>
<td>-6.13 (11.08)</td>
<td>-5.04 (11.66)</td>
</tr>
<tr>
<td><strong>Union</strong></td>
<td>9.13 (10.31)</td>
<td>10.00 (7.18)</td>
<td>11.24 (7.48) *</td>
</tr>
<tr>
<td><strong>South</strong></td>
<td>-17.52 (10.43)*</td>
<td>-4.91 (8.03)</td>
<td>-14.78 (8.71)*</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td>21.34 (10.70) *</td>
<td>28.77 (22.94)</td>
<td>20.47 (10.28)**</td>
</tr>
<tr>
<td><strong>Hours of housework per week</strong></td>
<td>-1.06 (0.44) **</td>
<td>-0.64 (0.35) *</td>
<td>-0.077 (0.33)** *</td>
</tr>
<tr>
<td><strong>Spouse real hourly wage (2011$)</strong></td>
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<td>-0.09 (0.07)</td>
<td>0.09 (0.07)</td>
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<tr>
<td><strong>Spouse hours of housework per week</strong></td>
<td>0.66 (0.58)</td>
<td>0.47 (0.51)</td>
<td>0.48 (0.39)</td>
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<td><strong>Spouse age</strong></td>
<td>2.25 (0.58)</td>
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<td><strong>R-squared</strong></td>
<td>0.1899</td>
<td>0.1608 (within)</td>
<td>0.1786/0.2116 (overall/between)</td>
</tr>
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<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>103.50 (53.13) *</td>
<td>73.59 (128.24)</td>
<td>122.10 (55.07) **</td>
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<tr>
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<tr>
<td></td>
<td>5.28</td>
<td>14.15</td>
<td>6.03</td>
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<tr>
<td></td>
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<td>(5.92) **</td>
<td>(2.69) **</td>
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<tr>
<td>Tenure (months)</td>
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<td>(2.29) *</td>
<td>(7.28)</td>
<td>(2.33) *</td>
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<td>Age Squared</td>
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<td>-0.04</td>
<td>-0.05</td>
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<tr>
<td></td>
<td>(0.03) **</td>
<td>(0.03) *</td>
<td>(0.02)*</td>
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<td>(4.56) *</td>
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<td>Kids less than 2</td>
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<td>8.60</td>
</tr>
<tr>
<td></td>
<td>(14.66)</td>
<td>(10.11)</td>
<td>(8.31)</td>
</tr>
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<td>Union</td>
<td>56.64</td>
<td>41.36</td>
<td>53.12</td>
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<tr>
<td></td>
<td>(11.00) ***</td>
<td>(19.99) **</td>
<td>(11.47) ***</td>
</tr>
<tr>
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<td></td>
<td>(7.76)</td>
<td>(14.06) *</td>
<td>(7.27)</td>
</tr>
<tr>
<td>Hours of housework per week</td>
<td>-0.76</td>
<td>0.29</td>
<td>-0.22</td>
</tr>
<tr>
<td></td>
<td>(0.68)</td>
<td>(0.69)</td>
<td>(0.65)</td>
</tr>
<tr>
<td>Spouse real hourly wage (2011$)</td>
<td>0.22</td>
<td>0.21</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>(0.01) ***</td>
<td>(0.01) ***</td>
<td>(0.0062) ***</td>
</tr>
<tr>
<td>Spouse hours of housework per week</td>
<td>-0.58</td>
<td>-0.47</td>
<td>-0.50</td>
</tr>
<tr>
<td></td>
<td>(0.37) *</td>
<td>(0.34)</td>
<td>(0.30) *</td>
</tr>
<tr>
<td>Spouse age</td>
<td>0.35</td>
<td>-2.13</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>(1.70)</td>
<td>(6.72)</td>
<td>(1.64)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.3367</td>
<td>0.1614 (within)</td>
<td>0.3315 (overall)</td>
</tr>
</tbody>
</table>

Note: All coefficients are multiplied by 100. Standard errors are in parentheses. All the estimates include dummy variables for each year. 
***, **, * indicate significance level at 1%, 5% and 10%, respectively.
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