THE BRC JOURNAL
of
ADVANCES IN BUSINESS
THE BRC JOURNAL
of
ADVANCES IN BUSINESS

CAMBRIA PRESS
Amherst, New York
# Table of Contents

*Papers are listed in alphabetical order according to last name.*

<table>
<thead>
<tr>
<th>Title</th>
<th>Author(s)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-Sectoral Competition and Conversions in the Mixed-Form Market of Postsecondary Education</td>
<td>Dr. Bonnie K. Fox Garrity &amp; Dr. Roger C. Fiedler</td>
<td>19</td>
</tr>
<tr>
<td>Relationships among World Governance Indicators and National Per Capital Income Weighted by Environmental Sustainability</td>
<td>Barry A. Friedman, Pamela L. Cox, Thomas Tribunella</td>
<td>37</td>
</tr>
<tr>
<td>Special Interests Groups Balancing Health Care Reform Concessions with Business Protection</td>
<td>Joseph P. Lyons, Janice L. Welker</td>
<td>55</td>
</tr>
<tr>
<td>A Framework for the Classification of Data and Information (DIQ) Literature</td>
<td>M. Pamela Neely, PhD, CPA</td>
<td>75</td>
</tr>
<tr>
<td>E-Discovery: The Intersection of Law, Technology and Business</td>
<td>Dr. Ian J. Redpath, Dr. Linda Volonino</td>
<td>98</td>
</tr>
</tbody>
</table>
The Price of Love: A Conceptual Model of Marriage and Taxes
*Thomas J. Tribunella, Heidi R. Tribunella & Laurie Phelps* 118

A Commentary on the Relationship between the Subprime Mortgage Crisis and the Savings and Loan Debacle
*Mark Mitschow & Michael Schinski* 140
Public Capital Investment, Unemployment Rates, and Labor Force Participation: What does the evidence tell us?

Christopher N. Annala

The effects of public capital on the economy are an area of interest among academics and policymakers. Public capital projects are often touted as a means to decrease unemployment rates. We present mixed results on the impact of public capital investment on unemployment rates and deviations in the unemployment rate. We find evidence that contemporaneous public capital investment increases the labor force participation rate.

Key Words: Unemployment Rate, Public Capital, Labor Force Participation.

1. INTRODUCTION

The global financial crisis and subsequent economic recession beginning in the United States in late 2008, has been met with a variety of responses from the U.S. government. The Federal Reserve met the economic slowdown with several measures to increase liquidity in financial markets and reduce interest rates. At the same time the Federal Government responded with the “American Recovery and Reinvestment Act

1 The author would like to thank participants of the Business Research Consortium, April 2010, at SUNY Geneseo and two anonymous referees for their informed and helpful comments. Any mistakes are the responsibility of the author.
of 2009” (ARRA). The ARRA increases spending on a variety of social programs and provides tax cuts to both households and corporations. Another important feature of ARRA is an increase in public infrastructure spending. Many of these programs, including the increase in infrastructure are intended to reduce unemployment and increase economic activity. This paper focuses on the potential impact of public capital spending on unemployment rates.

Beginning in the 1980’s and early 1990’s researchers began examining the impact of both the stock of public capital and public capital investment on private sector productivity. The early research focused on the role that the decline of public capital had on the global productivity slowdown experienced from the 1970’s through the mid 1990’s. Ratner (1983) provides the seminal paper to test for the effect of public capital on private output. Aschauer (1989) found that core infrastructure capital investment provided significant explanatory power for the productivity slowdown witnessed in the United States using national data. Subsequent studies have provided mixed results. Tatom (1991) argues that the relationship found by earlier researchers is spurious due to the nonstationarity of the data. Holtz-Eakin (1993) concludes that when the sample is a panel of the forty-eight contiguous states over the years 1969 to 1986 the elasticity of private output with respect to state and local government capital is essentially zero.

Munnell (1990) performs several exercises to determine the impact of public capital on private sector performance. One of these exercises explores the relationship between public capital and employment growth using a sample of individual states. According to Munnell, “The evidence seems overwhelming that public capital has a positive impact on private sector output, investment, and employment” (1990: pp. 26). Demetriades and Mamuneas (2000) examine the impact of public capital on manufacturing employment using a panel of twelve OECD countries; they find that increases in public capital infrastructure increase employment. Using time series data for the United States, Batina (1999) finds that the impact of public capital depends on the proxies used and that the effects are much smaller than those estimated by Aschauer and Munnell.
Although inconclusive as to the magnitude of the impact public capital has on economic growth, there appears to be empirical support for the role public capital has in influencing private sector activity.

The contribution of this paper is to examine, in greater detail, the effect of public capital investment on private sector unemployment. In general, the above research focuses on the relationship between economic growth and public capital which is considered a long-run phenomenon, whereas the relationship between public capital and unemployment is made more difficult as fluctuations in the unemployment rate are considered short-run phenomenon. At this point an important distinction must be made regarding public capital and public capital investment. First, the long-run relationship between the “stock” of public capital and economic growth is based on the theory that public capital increases the marginal product of labor or the marginal product of capital, or both. Second, the relationship between unemployment and public capital “investment” is a short-run relationship; the government can increase infrastructure spending that will increase employment and reduce unemployment in the short-run, independent of the potential long-run implications. The use of public capital projects to reduce unemployment has a long history. For example, as part of Franklin D. Roosevelt’s “New Deal” the Public Works Administration (PWA) was established as part of the National Industrial Recovery Act of 1933. The PWA was responsible for the construction of roads, buildings, dams and other projects in an effort to reduce unemployment and increase economic activity. In its 10-year existence, the PWA spent more than $4 billion on public projects. The projects undertaken by the PWA are precisely the types of public capital infrastructure projects which proponents argue should be included in the ARRA in order to return the economy to full employment.

The impact of public capital investment on private sector employment and unemployment is an empirical question. Increases in public capital investment that increase the marginal product of private capital may cause firms to substitute away from labor and toward capital. However, if the public capital investment is labor-augmenting, an increase in public capital investment may cause firms to increase employment which will
reduce unemployment rates. Given the ambiguity regarding the causal-
ity between public capital investment and unemployment or labor force
participation rates it is important to study the empirical relationship. The
remainder of this paper is organized as follows: Section 2 discusses the
data used in the analysis, section 3 discusses the estimation techniques
and results, and section 4 provides concluding remarks.

2. DATA

The data used in this study cover the contiguous 48 United States from
2004 to 2006. The data on the fiscal variables, including public capital
expenditures, taxes, and current expenditures less unemployment com-
pensation are taken from the annual reports on State & Local Government
Finances from the U.S. Census Bureau.\textsuperscript{2} Unemployment compensation
is removed from the current expenditures to avoid simultaneity bias,
states with higher levels of unemployment compensation are also going
to be states with higher unemployment rates. Unfortunately, state level
data are unavailable for fiscal years 2000–01 and 2002–03 necessitating
a relatively short panel. The fiscal variables in Table 1 are presented as
a percent of total gross state product (GSP). Over all 48 states, for the
three years in the sample, the mean level of public capital expenditure
is approximately 2.25 percent of GSP, current expenditure represents 14.37
percent of GSP, and the mean level of taxes is 8.87 percent of GSP.

Table 2 presents data on unemployment rates for the 48 states in several
ways. The first column of Table 2 is the average unemployment rate for
each state from 1976–2008, the longest time series on state-level unem-
ployment rates available from the Bureau of Labor Statistics.\textsuperscript{3} This long
term average unemployment rate is taken to be the “natural rate” of unem-
ployment, \( U^* \), for each state. The 1976 to 2008 time period covers five
expansions and five contractions (including the contraction beginning in
2008) in the United States, as dated by the National Bureau of Economic

\textsuperscript{2} Data available at: http://www.census.gov/govs/www/estimate.html
\textsuperscript{3} Data available at: http://www.bls.gov/lau/
TABLE 1. Average Values of Fiscal Variables as a Percent of Gross State Product Across 48 States.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004 Capital Expenditures</td>
<td>2.27</td>
<td>2.20</td>
<td>3.40</td>
<td>1.31</td>
<td>0.54</td>
</tr>
<tr>
<td>2005 Capital Expenditures</td>
<td>2.23</td>
<td>2.21</td>
<td>3.60</td>
<td>1.31</td>
<td>0.50</td>
</tr>
<tr>
<td>2006 Capital Expenditures</td>
<td>2.26</td>
<td>2.21</td>
<td>3.25</td>
<td>1.44</td>
<td>0.43</td>
</tr>
<tr>
<td>2004 Current Expenditures</td>
<td>14.31</td>
<td>14.15</td>
<td>20.05</td>
<td>9.82</td>
<td>2.17</td>
</tr>
<tr>
<td>2006 Current Expenditures</td>
<td>14.37</td>
<td>14.30</td>
<td>20.41</td>
<td>10.54</td>
<td>2.16</td>
</tr>
<tr>
<td>2004 Total Taxes</td>
<td>8.66</td>
<td>8.55</td>
<td>11.78</td>
<td>5.72</td>
<td>1.11</td>
</tr>
<tr>
<td>2005 Total Taxes</td>
<td>8.88</td>
<td>8.92</td>
<td>12.09</td>
<td>5.72</td>
<td>1.23</td>
</tr>
<tr>
<td>2006 Total Taxes</td>
<td>9.07</td>
<td>9.21</td>
<td>12.53</td>
<td>6.07</td>
<td>1.25</td>
</tr>
</tbody>
</table>

Research, providing reasonable estimates of the natural rates of unemployment for each state.\(^4\) The second, fourth, and sixth columns of Table 2 provide the annual estimates of unemployment rates, \(U\), for each state from 2004 through 2006. Finally, the third, fifth and seventh columns in Table 2 present the deviation \((U – U^*)\) of the annual unemployment rate from the natural rate of unemployment from 2004 through 2006. From the table it is clear that most states were experiencing low unemployment rates relative to their specific natural rate of unemployment. Using state specific natural rates of unemployment rather than an estimate of the U.S. natural rate allows for differences between states, based on changes in demographics and changes in the industrial mix of each state. To account for the difference between the impact of public capital on the long-run economy and the short-run stimulus effect of public capital investment both the annual unemployment rate and the deviation from the annual unemployment rate will be used in the analysis. One characteristic to note

\(^4\) Dates for the business cycles are taken from the NBER website and are available at: http://www.nber.org/cycles.html
from Table 2 is that the deviations in the annual unemployment rate from the natural rate of unemployment for the most part is negative, indicating that for most states the annual rate of unemployment between 2004 and 2006 was below that state’s natural rate of unemployment. This would be a reasonable indication of the general health of the national economy during the time period.

To account for differences in demographics and differences in economic circumstances in the 48 contiguous United States we will also include several additional explanatory variables in our estimations to act as control variables. These conditioning variables include; the growth rate of gross state product, the share of manufacturing, educational attainment, the population over age 65, and the nonwhite population.

The annual growth rate in real gross state product is included as a conditioning variable, based on Okun’s Law. As had been demonstrated by Okun (1962) at the national level there is a negative relationship between GDP growth and the unemployment rate. Over the three-year period the average growth rate in gross state product, across all states is 3.0 percent with a maximum occurring in Nevada in 2004, with a growth rate of 9.66 percent. As a second economic variable we also include the share of manufacturing in total gross state product. This variable is included to account for the general shift in the industrial mix from manufacturing to services. These changes have been particularly noticeable in the upper-Midwest, as a result of a decline in the automotive industry. Across all states there has been a slight decline in manufacturing as a share of gross state product from 14.7 percent in 2004 to 14.15 percent in 2006 and the average over all three years is 14.42 percent. The highest share of manufacturing as a percent of total gross state product occurred in Indiana in 2004, with a share of 31.25 percent. Regional economic data including those used in this analysis are taken from the Bureau of Economic Analysis.5

The educational attainment variable used in this analysis is the percent of the population of the ith state with at least a bachelor’s degree and was

---

5 Data available at: http://www.bea.gov/regional/gsp/
Public Capital Investment, Unemployment Rates  

taken from the U.S. Census Bureau, Current Population Survey. It is generally assumed that a better educated workforce, ceteris paribus, will have a lower rate of unemployment. For the U.S. as a whole the unemployment rate for those with a bachelor’s degree or higher is consistently much lower than the overall unemployment rate for all education levels. For all states and all years the average share of the population with at least a bachelor’s degree is 26.92 percent. The highest share of the population with at least a bachelor’s degree occurred in Massachusetts in 2006, with a share of 40.4 percent.

To address general demographic differences between states two additional demographic variables are included in the analysis; these include the percentage of the population over age 65 and the share of the non-white population, by state. The data on population over age 65 and the share of the non-white population are taken from the U.S. Census Bureau vintage series. The inclusion of the variable, percentage of the population over age 65, is included to account for the share of the population that is less likely to be attached to the labor force. Although Americans have tended to work later into life in recent years, this variable helps to address a basic demographic difference between states. In 2006, for all states the average percentage of population over age 65 is 12.76 percent. The state with the largest share of the population over age 65 is Florida with 16.79 percent and the state with the smallest share of the population over age 65 is Utah with 8.84 percent. The inclusion of the variable, the share of the non-white population, is intended to account for the fact that the unemployment rate for non-whites for the U.S. as a whole is consistently higher than for whites. Therefore, states with larger shares of non-whites would likely tend to experience higher rates of unemployment. The average share of non-whites across all states and all years is 16.21 percent. The state with the largest share of non-whites in 2006, is Mississippi with a total of 39.13 percent of the population.

---

6 Data available at: http://www.census.gov/population/www/socdemo/educ-attn.html
### Table 2. Unemployment Rate by State.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U*</td>
<td>U</td>
<td>U – U*</td>
<td>U</td>
</tr>
<tr>
<td>Alabama</td>
<td>6.5</td>
<td>5</td>
<td>−1.5</td>
<td>3.8</td>
</tr>
<tr>
<td>Arizona</td>
<td>5.9</td>
<td>5</td>
<td>−0.9</td>
<td>4.6</td>
</tr>
<tr>
<td>Arkansas</td>
<td>6.4</td>
<td>5.6</td>
<td>−0.8</td>
<td>5.1</td>
</tr>
<tr>
<td>California</td>
<td>7</td>
<td>6.2</td>
<td>−0.8</td>
<td>5.4</td>
</tr>
<tr>
<td>Colorado</td>
<td>5.3</td>
<td>5.6</td>
<td>0.3</td>
<td>5.1</td>
</tr>
<tr>
<td>Connecticut</td>
<td>5</td>
<td>4.9</td>
<td>−0.1</td>
<td>4.9</td>
</tr>
<tr>
<td>Delaware</td>
<td>5</td>
<td>3.9</td>
<td>−1.1</td>
<td>4</td>
</tr>
<tr>
<td>Florida</td>
<td>6</td>
<td>4.7</td>
<td>−1.3</td>
<td>3.8</td>
</tr>
<tr>
<td>Georgia</td>
<td>5.5</td>
<td>4.7</td>
<td>−0.8</td>
<td>5.2</td>
</tr>
<tr>
<td>Idaho</td>
<td>5.8</td>
<td>4.6</td>
<td>−1.2</td>
<td>3.7</td>
</tr>
<tr>
<td>Illinois</td>
<td>6.7</td>
<td>6.2</td>
<td>−0.5</td>
<td>5.8</td>
</tr>
<tr>
<td>Indiana</td>
<td>5.8</td>
<td>5.3</td>
<td>−0.5</td>
<td>5.4</td>
</tr>
<tr>
<td>Iowa</td>
<td>4.7</td>
<td>4.6</td>
<td>−0.1</td>
<td>4.3</td>
</tr>
<tr>
<td>Kansas</td>
<td>4.6</td>
<td>5.5</td>
<td>0.9</td>
<td>5.1</td>
</tr>
<tr>
<td>Kentucky</td>
<td>6.6</td>
<td>5.6</td>
<td>−1</td>
<td>6.1</td>
</tr>
<tr>
<td>Louisiana</td>
<td>7.2</td>
<td>5.5</td>
<td>−1.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Maine</td>
<td>5.7</td>
<td>4.6</td>
<td>−1.1</td>
<td>4.9</td>
</tr>
<tr>
<td>Maryland</td>
<td>5.1</td>
<td>4.3</td>
<td>−0.8</td>
<td>4.1</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>5.5</td>
<td>5.2</td>
<td>−0.3</td>
<td>4.8</td>
</tr>
<tr>
<td>Michigan</td>
<td>7.9</td>
<td>7.1</td>
<td>−0.8</td>
<td>6.8</td>
</tr>
<tr>
<td>Minnesota</td>
<td>4.8</td>
<td>4.6</td>
<td>−0.2</td>
<td>4.2</td>
</tr>
<tr>
<td>Mississippi</td>
<td>7.7</td>
<td>6.3</td>
<td>−1.4</td>
<td>7.8</td>
</tr>
<tr>
<td>Missouri</td>
<td>5.7</td>
<td>5.8</td>
<td>0.1</td>
<td>5.4</td>
</tr>
<tr>
<td>Montana</td>
<td>5.7</td>
<td>4</td>
<td>−1.7</td>
<td>3.7</td>
</tr>
<tr>
<td>Nebraska</td>
<td>3.4</td>
<td>3.9</td>
<td>0.5</td>
<td>3.9</td>
</tr>
<tr>
<td>Nevada</td>
<td>6</td>
<td>4.4</td>
<td>−1.6</td>
<td>4.5</td>
</tr>
</tbody>
</table>
These two variables are intended to account for some of the cross-sectional difference and population characteristics between the 48 states in the sample.
3. Estimation and Results

To estimate the impact of public capital investment on unemployment rates several equations are specified. We begin with a pooled regression, with no state or time effects given by equation (1).

\[ U_{s,t} = \beta_0 + \sum_{i=1}^{k} \beta_i x_{s,t} + \epsilon_{s,t}, \]  

Where \( U_{s,t} \) represents the annual unemployment in state \( s \), in time period \( t \), and \( x_{s,t} \) represents the \( i \)th explanatory variable: public capital expenditures, current expenditures, total taxes, including lagged values of the fiscal variables and the various conditioning variables. The inclusion of the lagged fiscal variables is intended to capture the fact that current fiscal policies may in part be a reaction to past economic activity. Policy changes and the economic impact of those policy changes are not instantaneous due to both inside lags and outside lags; meaning that policymakers may recognize slowed economic growth and rising unemployment in time period \( t-1 \), however the policymakers will not be able to alter the current policy until time period \( t \). Reed (2008) demonstrates that the inclusion of lagged fiscal variables improves the estimation results. The results of this estimation appear in Table 4, including the White-heteroskedasticity-corrected standard errors. All of the independent variables are statistically significant at the 10-percent level except for the share of population over 25 with a B.A. degree and both current expenditures as a share of GSP and the lagged value of current expenditures as a share of GSP. Based on this estimation a one percent increase in contemporaneous public investment as a share of GSP, results in a 0.93 percent decrease in the annual unemployment rate however the same one-percent increase in the share of GSP in the previous year actually results in a 0.75 percent increase in the annual unemployment rate. The net effect over the two years is therefore negative which is what we would expect if public capital investment were to have beneficial effects on private sector unemployment rates. We also find a similar relationship regarding taxes, where a one-percent increase in contemporaneous taxes as a share of GSP is associated with a 0.81 percent decrease in
the unemployment rate and a one-percent increase in lagged taxes as a share of GSP results in a 0.87 percent increase in the annual unemployment rate. The net effect is therefore a slight increase in unemployment rates, as would be anticipated under the hypothesis that increases in taxes, increase unemployment rates. A one-percent increase in the growth rate of gross state product results in a 0.08 decrease in the annual unemployment rate. All of the other conditioning variables are significant at the ten-percent level and their signs agree with basic a priori assumptions, where those states more reliant on the manufacturing sector tend to have higher unemployment rates, as the share of population over age 65 increases the unemployment rate decreases, and states with a higher share of non-white tend to have higher annual unemployment rates.

To account for the short-run effects of public capital investment we also estimate the pooled cross-section model with the deviation from the state specific natural unemployment rate as the dependent variable.

\[ U_{s,t} - U_{s,t}^* = \beta_0 + \sum_{i=1}^{k} \beta_i x_{s,t}^i + \epsilon_{s,t}, \]  

(2)

This estimation is intended to give us a better understanding of the role that public capital investment may play in altering the unemployment rate and is more closely related to the idea of using public capital as a tool for economic stimulus. The results of this estimation are presented in Table 5. For this specification, neither of the public capital investment variables is statistically significant at conventional levels, indicating that public capital investment has little impact on the deviation in unemployment rate, from the natural rate of unemployment. The explanatory variables that are statistically significant at the ten-percent level include lagged current expenditures, both contemporaneous and lagged taxes, the growth rate of gross state product, the share of the population with a Bachelors’ degree and the share of manufacturing as a percent of GSP. As with the previous estimation the contemporaneous value of taxes is inversely related to the deviation in the unemployment rate and the lagged value of taxes as a share of GSP is positively related to the deviation in
**Table 3.** Other Explanatory Variables, All States.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>% B.A. 2004</td>
<td>26.84</td>
<td>25.50</td>
<td>36.70</td>
<td>15.30</td>
<td>4.85</td>
<td>0.30</td>
<td>2.64</td>
</tr>
<tr>
<td>% B.A. 2005</td>
<td>26.86</td>
<td>25.55</td>
<td>36.80</td>
<td>15.10</td>
<td>5.18</td>
<td>0.19</td>
<td>2.65</td>
</tr>
<tr>
<td>% B.A. 2006</td>
<td>27.06</td>
<td>26.40</td>
<td>40.40</td>
<td>15.90</td>
<td>5.29</td>
<td>0.37</td>
<td>2.65</td>
</tr>
<tr>
<td>Growth Rate GSP 2004</td>
<td>3.42</td>
<td>3.37</td>
<td>9.66</td>
<td>−0.96</td>
<td>1.94</td>
<td>0.70</td>
<td>4.47</td>
</tr>
<tr>
<td>Growth Rate GSP 2005</td>
<td>2.77</td>
<td>2.02</td>
<td>8.44</td>
<td>−0.88</td>
<td>2.25</td>
<td>0.80</td>
<td>2.91</td>
</tr>
<tr>
<td>Growth Rate GSP 2006</td>
<td>2.81</td>
<td>2.54</td>
<td>7.48</td>
<td>−1.36</td>
<td>1.83</td>
<td>0.42</td>
<td>3.28</td>
</tr>
<tr>
<td>% Manufacturing 2004</td>
<td>14.70</td>
<td>13.37</td>
<td>31.25</td>
<td>4.44</td>
<td>5.90</td>
<td>0.43</td>
<td>2.78</td>
</tr>
<tr>
<td>% Manufacturing 2005</td>
<td>14.41</td>
<td>13.30</td>
<td>29.91</td>
<td>3.97</td>
<td>5.91</td>
<td>0.37</td>
<td>2.62</td>
</tr>
<tr>
<td>% Manufacturing 2006</td>
<td>14.15</td>
<td>13.26</td>
<td>28.52</td>
<td>3.63</td>
<td>5.92</td>
<td>0.35</td>
<td>2.44</td>
</tr>
<tr>
<td>Population Over 65 2004</td>
<td>12.65</td>
<td>12.77</td>
<td>16.83</td>
<td>8.69</td>
<td>1.53</td>
<td>−0.07</td>
<td>3.76</td>
</tr>
<tr>
<td>Population Over 65 2005</td>
<td>12.72</td>
<td>12.84</td>
<td>16.83</td>
<td>8.75</td>
<td>1.51</td>
<td>−0.13</td>
<td>3.83</td>
</tr>
<tr>
<td>Population Over 65 2006</td>
<td>12.76</td>
<td>12.87</td>
<td>16.79</td>
<td>8.84</td>
<td>1.48</td>
<td>−0.18</td>
<td>3.90</td>
</tr>
<tr>
<td>% Nonwhite 2004</td>
<td>16.06</td>
<td>14.65</td>
<td>38.67</td>
<td>3.05</td>
<td>9.41</td>
<td>0.68</td>
<td>2.65</td>
</tr>
<tr>
<td>% Nonwhite 2005</td>
<td>16.19</td>
<td>14.75</td>
<td>38.79</td>
<td>3.08</td>
<td>9.45</td>
<td>0.67</td>
<td>2.64</td>
</tr>
<tr>
<td>% Nonwhite 2006</td>
<td>16.38</td>
<td>14.96</td>
<td>39.13</td>
<td>3.27</td>
<td>9.37</td>
<td>0.66</td>
<td>2.63</td>
</tr>
</tbody>
</table>
### Table 4

Dependent Variable is Annual Unemployment Rate

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>3.688</td>
<td>1.428</td>
<td>2.582</td>
<td>0.012</td>
</tr>
<tr>
<td>Capital Investment</td>
<td>-0.926</td>
<td>0.436</td>
<td>-2.125</td>
<td>0.037</td>
</tr>
<tr>
<td>Capital Investment (-1)</td>
<td>0.746</td>
<td>0.404</td>
<td>1.847</td>
<td>0.068</td>
</tr>
<tr>
<td>Current Expenditures</td>
<td>0.233</td>
<td>0.297</td>
<td>0.785</td>
<td>0.435</td>
</tr>
<tr>
<td>Current Expenditures (-1)</td>
<td>-0.109</td>
<td>0.273</td>
<td>-0.398</td>
<td>0.691</td>
</tr>
<tr>
<td>Taxes</td>
<td>-0.806</td>
<td>0.312</td>
<td>-2.580</td>
<td>0.012</td>
</tr>
<tr>
<td>Taxes (-1)</td>
<td>0.868</td>
<td>0.319</td>
<td>2.725</td>
<td>0.008</td>
</tr>
<tr>
<td>% Change Gross State Product</td>
<td>-0.081</td>
<td>0.048</td>
<td>-1.694</td>
<td>0.094</td>
</tr>
<tr>
<td>% Bachelors’ Degree</td>
<td>-0.012</td>
<td>0.019</td>
<td>-0.650</td>
<td>0.517</td>
</tr>
<tr>
<td>% Manufacturing</td>
<td>0.058</td>
<td>0.017</td>
<td>3.498</td>
<td>0.001</td>
</tr>
<tr>
<td>% Nonwhite Population</td>
<td>0.031</td>
<td>0.011</td>
<td>2.898</td>
<td>0.005</td>
</tr>
<tr>
<td>% Population Over 65</td>
<td>-0.126</td>
<td>0.062</td>
<td>-2.039</td>
<td>0.045</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.477</td>
<td></td>
<td></td>
<td>4.634</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.409</td>
<td></td>
<td></td>
<td>0.995</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.765</td>
<td></td>
<td></td>
<td>2.419</td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>49.202</td>
<td></td>
<td></td>
<td>2.740</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-104.134</td>
<td></td>
<td></td>
<td>6.971</td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>0.693</td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
</tbody>
</table>

the unemployment rate. Both the share of the manufacturing sector as a percent of GSP and the growth rate of GSP have signs that agree with our \textit{a priori} expectations. States that are more heavily dependent on the manufacturing sector tend to have a higher unemployment rate relative to its natural rate of unemployment and states that have higher rates of
Table 5

Dependent Variable is Deviation in Annual Unemployment Rate (U−U*)

Cross-sections included: 48

Total panel observations: 96

White diagonal standard errors & covariance (d.f. corrected)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>−1.154</td>
<td>1.636</td>
<td>−0.705</td>
<td>0.483</td>
</tr>
<tr>
<td>Capital Investment</td>
<td>−0.486</td>
<td>0.526</td>
<td>−0.925</td>
<td>0.358</td>
</tr>
<tr>
<td>Capital Investment (−1)</td>
<td>0.456</td>
<td>0.486</td>
<td>0.939</td>
<td>0.351</td>
</tr>
<tr>
<td>Current Expenditures</td>
<td>0.561</td>
<td>0.356</td>
<td>1.574</td>
<td>0.119</td>
</tr>
<tr>
<td>Current Expenditures (−1)</td>
<td>−0.557</td>
<td>0.330</td>
<td>−1.688</td>
<td>0.095</td>
</tr>
<tr>
<td>Taxes</td>
<td>−0.991</td>
<td>0.388</td>
<td>−2.552</td>
<td>0.013</td>
</tr>
<tr>
<td>Taxes (−1)</td>
<td>0.920</td>
<td>0.401</td>
<td>2.293</td>
<td>0.024</td>
</tr>
<tr>
<td>% Change Gross State Product</td>
<td>−0.081</td>
<td>0.048</td>
<td>−1.674</td>
<td>0.098</td>
</tr>
<tr>
<td>% Bachelors' Degree</td>
<td>0.045</td>
<td>0.026</td>
<td>1.715</td>
<td>0.090</td>
</tr>
<tr>
<td>% Manufacturing</td>
<td>0.044</td>
<td>0.019</td>
<td>2.315</td>
<td>0.023</td>
</tr>
<tr>
<td>% Nonwhite Population</td>
<td>−0.006</td>
<td>0.010</td>
<td>−0.574</td>
<td>0.568</td>
</tr>
<tr>
<td>% Population Over 65</td>
<td>−0.058</td>
<td>0.066</td>
<td>−0.875</td>
<td>0.384</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.289</td>
<td></td>
<td></td>
<td>−1.187</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.196</td>
<td>S.D. dependent var</td>
<td>0.895</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.803</td>
<td>Akaike info criterion</td>
<td>2.514</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>54.106</td>
<td>Schwarz criterion</td>
<td>2.835</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>−108.694</td>
<td>F-statistic</td>
<td>3.105</td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>0.666</td>
<td>Prob(F-statistic)</td>
<td>0.002</td>
<td></td>
</tr>
</tbody>
</table>

growth in GSP tend to have lower rates of unemployment relative to its natural rate of unemployment.

The impact of public capital investment on labor force participation is difficult to determine theoretically. Assuming there are workers that are currently not working, and therefore not a part of the labor
force, an increase in public capital investment that creates job openings, may encourage some of these workers to re-enter the labor force and therefore increase the labor force participation rate. Table 6 presents the results of the pooled regression with the labor force participation rate in state \( s \), as the dependent variable. This estimation employs the same collection of dependent variables from above, as represented in the equation below.

\[
LFPR_{s,t} = \beta_0 + \sum_{i=1}^{k} \beta_i x_{s,t}^i + \epsilon_{s,t},
\]

The results from this estimation are both relatively strong and intuitive. The estimated intercept is 69.5 which is only slightly higher than the mean labor force participation rate across all states and time periods, which is 67.04. In this estimation the three variables which are not statistically significant at conventional levels are lagged public capital investment and both contemporaneous and lagged current expenditures. Based on the results for the contemporaneous public capital investment variable; a one-percent increase in public capital as a share of GSP, increases the labor force participation rate by 2.65 percent. We again find conflicting signs for contemporaneous taxes as a share of GSP and lagged taxes as a share of GSP. An increase in contemporaneous taxes as a share of GSP results in a 0.63 decrease in the labor force participation rate, which represents much of the conventional thinking that an increase in taxes reduces labor force participation. On the other hand an increase in the lagged value of taxes as a share of GSP has a positive impact on labor force participation. The net impact of the two coefficients is negative, which follows general sentiment.

4. CONCLUDING REMARKS

This paper presents evidence that public capital investment has a net impact of reducing the unemployment rate in levels but not of reducing the unemployment rate from the “natural rate” of unemployment. We also
find evidence that increases in public capital investment increases labor force participation rates. These results support the notion held by many policymakers that one way to reduce the unemployment rate and

### TABLE 6

Dependent Variable: Labor Force Participation Rate

Pooled Cross Section Estimation

Cross-sections included: 48

Total panel (balanced) observations: 96

White cross-section standard errors & covariance (d.f. corrected)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>69.504</td>
<td>0.452</td>
<td>153.822</td>
<td>0.000</td>
</tr>
<tr>
<td>Capital Investment</td>
<td>2.653</td>
<td>0.198</td>
<td>13.402</td>
<td>0.000</td>
</tr>
<tr>
<td>Capital Investment (−1)</td>
<td>0.079</td>
<td>0.486</td>
<td>0.163</td>
<td>0.871</td>
</tr>
<tr>
<td>Current Expenditures</td>
<td>−0.243</td>
<td>0.591</td>
<td>−0.412</td>
<td>0.682</td>
</tr>
<tr>
<td>Current Expenditures (−1)</td>
<td>−0.290</td>
<td>0.596</td>
<td>−0.486</td>
<td>0.628</td>
</tr>
<tr>
<td>Taxes</td>
<td>−0.630</td>
<td>0.146</td>
<td>−4.319</td>
<td>0.000</td>
</tr>
<tr>
<td>Taxes (−1)</td>
<td>0.464</td>
<td>0.058</td>
<td>8.023</td>
<td>0.000</td>
</tr>
<tr>
<td>% Change Gross State Product</td>
<td>−0.450</td>
<td>0.009</td>
<td>−50.928</td>
<td>0.000</td>
</tr>
<tr>
<td>% Bachelors' Degree</td>
<td>0.361</td>
<td>0.006</td>
<td>63.295</td>
<td>0.000</td>
</tr>
<tr>
<td>% Manufacturing</td>
<td>0.061</td>
<td>0.006</td>
<td>9.974</td>
<td>0.000</td>
</tr>
<tr>
<td>% Nonwhite Population</td>
<td>−0.182</td>
<td>0.009</td>
<td>−19.779</td>
<td>0.000</td>
</tr>
<tr>
<td>% Population Over 65</td>
<td>−0.450</td>
<td>0.080</td>
<td>−5.630</td>
<td>0.000</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.603</td>
<td>Mean dependent var</td>
<td>67.042</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.551</td>
<td>S.D. dependent var</td>
<td>3.760</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>2.519</td>
<td>Akaike info criterion</td>
<td>4.802</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>532.895</td>
<td>Schwarz criterion</td>
<td>5.122</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>−218.489</td>
<td>F-statistic</td>
<td>11.609</td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>0.203</td>
<td>Prob(F-statistic)</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>
therefore increase economic activity is through increased funding of public capital projects. The federal government has substantially increased public capital funding through the “American Recovery and Reinvestment Act of 2009” in an effort to stabilize the US economy. Based on the results from this study we would expect that this funding will have a positive effect on the US economy, however it is important to note that these positive effects may occur with a lag. Further complicating the relationship between public capital investment and economic activity is the possibility of public borrowing for private purposes where the impacts on the economy and labor markets would be very similar, yet difficult to identify with currently available data. This issue, combined with the possibility that public capital may be a substitute for private capital makes the empirical analysis more difficult. Policymakers must consider the possibility of substitution between private capital and labor as firms seek to maximize profits. Future research on the impact of public capital investment and labor market conditions would benefit from greater data availability, as the data on state and local public finance contains several gaps. A longer time series would also allow for greater variation in unemployment rates within a given state.
REFERENCES


Cross-Sectoral Competition and Conversions in the Mixed-Form Market of Postsecondary Education

Dr. Bonnie K. Fox Garrity & Dr. Roger C. Fiedler

Mixed-form markets include public, not-for-profit, and for-profit providers competing within a specific industry. The cross-sectoral competition within mixed-form markets such as postsecondary education has increased as the constraints on providers have changed. As the competition has evolved, some providers have chosen to convert from one form of control to another, or have been acquired by a provider from a different sector. This study quantifies the changes in control in the postsecondary education industry over the past 15 years. The trends in the conversions data show that from 1994 to 2002 changes to not-for-profit status were the most common. However, since 2003 a majority of the changes each year have been from public or not-for-profit to for-profit status. In 2007, all conversions that occurred were from not-for-profit to for-profit status. The implications of the changes in constraints and cross-sectoral competition within this industry are examined within the framework of the mixed-form market literature.

Mixed-form markets include public, not-for-profit, and for-profit providers competing within a specific industry (Marwell & McInerney, 2005). Within the industry of postsecondary education, a public institution is operated by publicly elected or appointed officials and derives its primary support from public funds. At a not-for-profit institution the individual(s) or agency in control receives no compensation other than wages, rent, or other expenses for the assumption of risk (Snyder, Tan, & Hoffman, 2006, Appendix B: Definitions). In a for-profit institution the individual(s) or agency in control receives compensation other than wages, rent, or

Dr. Bonnie K. Fox Garrity and Dr. Roger C. Fiedler D’Youville College, Buffalo, New York.
other expenses for the assumption of [financial] risk (Snyder et al., 2006, Appendix B: Definitions).

These various forms of providers of postsecondary education in the United States compete in a mixed-form market characterized by growth, increasing costs, increasing prices, and cross subsidy of students (both based upon different costs of providing certain programs and differing levels of net tuition and fees paid by students).

There are many incentives for providers in this mixed-form market to reconsider their initially selected form of control. These include the reduction in private donations, stagnation and reductions of state and local subsidies, deregulation (particularly the inclusion of for-profit providers in a similar legal framework as not-for-profit and public providers), and the portability of Pell grant aid, coupled with the for-profit providers’ access to market capital to fuel growth, and the potential economies of scale of large institutions. Some institutions have chosen a new form of control while others have merged with or been acquired by an institution from a different sector. This article provides the first study of the numbers and directions of these changes in control within the postsecondary education market in the United States.

**Theoretical Framework and Relevant Literature**

Mixed-form markets are markets in which public, not-for-profit, and for-profit providers coexist and often compete to provide goods and services. The literature indicates that there is competition between these providers and that they may be considered to be adversaries (Becchetti & Huybrechts, 2008; Bagnoli & Watts, 2003; Marwell and McInerny, 2005; Steinberg, 1987). In postsecondary education, traditionally each form of provider served a particular niche. However, growth and expansion have lead to direct competition among all three forms of providers for all levels of postsecondary students, most notably at the 4-year and above levels of students. For-profit provision of postsecondary education has grown more rapidly than not-for-profit or public. For-profit enrollment has grown at an average rate of 9% per year over the past 30 years, although overall
Changes in Control in Mixed Form Markets

Table 1. Relative Market Share of Fulltime Equivalent Postsecondary Students in the United States

<table>
<thead>
<tr>
<th>Control</th>
<th>1993</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>73%</td>
<td>67%</td>
</tr>
<tr>
<td>Not-for-profit</td>
<td>21%</td>
<td>22%</td>
</tr>
<tr>
<td>For-profit</td>
<td>6%</td>
<td>11%</td>
</tr>
</tbody>
</table>

1 Source of these data are IPEDS 1993 and 2004.

enrollment in postsecondary education has grown by only 1.5% (Wilson, 2010). For-profit providers now enroll more than 10% of postsecondary students in the United States (Wilson, 2010). Table 1 includes the relative market share of each group of providers in 1993 and 2004.

Competition in Mixed-Form Markets

Marwell and McInerney (2005) identify a five stage process to describe how competition between not-for-profit and for-profit providers develops in a mixed-form market. The first step is market identification where a not-for-profit identifies a social need and often provides a service to clients at a price that is less than the costs incurred. However, whenever there is a decrease in private donations and government subsidies, the not-for-profit becomes more dependent on revenue generation to meet costs.

The second step is market growth. As a not-for-profit establishes the legitimacy of the need identified and their ability to fulfill that need, a market is created. Other not-for-profit organizations will often enter this market as long as the need (or at least a portion of the market’s need) remains unsatisfied.

The third step is increasing cost of providing the service as not-for-profit organizations grow to meet the increasing demand for their services. This growth often results in additional administrative needs which increase the costs of providing the services.

The fourth step is increasing price (or need for revenue) which is a direct result of the increasing costs. The increased need for revenue can
be satisfied through donations or through increased prices charged to those served. Cross subsidy can be used to off-set increased costs of provision of a limited subset of the institution’s services. This practice may delay the entry of for-profit providers into a market as the profit potential of a particular good or service may be obscured to those outside of the not-for-profit organization. If prices are increased to be equal to or greater than costs for a service and the market continues to demand the service, for-profits may then attempt to enter the market.

The final step is cross-sectoral competition marked by the entry of for-profits into a market traditionally served by not-for-profits and publics. Marwell and McInerny (2005) have identified three potential pathways for markets in this stage: stratified, displaced, or defended.

In a stratified market not-for-profits serve low-income consumers with costs of provision subsidized by donors and for-profits serve higher-income consumers who pay market rates. In a displaced market not-for-profits are pushed out by the for-profits who have entered the market later. This is often a result of a lack of sufficient donations to cover increasing costs. Displaced markets also may occur when there is rapid expansion of the pool of consumers willing and able to purchase the service. In a defended market, not-for-profits use fundraising, regulation, or legitimacy as arguments to defend against the entry and growth of for-profit providers.

**Changes in Constraints and Control**

Within a mixed-form market, individual institutions have the opportunity to reassess and possibly change their form of control to suit the current conditions. Changes in constraints, according to Goddeeris and Weisbrod (1998), may encourage organizations to consider changing form. These may include changes to tax laws or regulations and changes in the availability of private donations and government grants and contracts.

For example, if constraints change and conditions are more favorable for for-profit providers, not-for-profit or public institutions could reassess and potentially change their form. Therefore, one method to assess the current market conditions in a mixed-form market is to investigate recent changes in control among providers in that market.
Changes in control may be a result of an internal decision to change form or a result of merger and acquisition activity. There have been waves of merger and acquisition activity in U.S. economic history and these waves have been concentrated within certain industries and even within certain geographic regions. This has lead researchers to conclude that merger and acquisition activity may be driven by factors such as shocks to an industry’s structure; deregulation; technological innovations which can create excess capacity and the need for industry consolidation; and supply shocks (Andrade, Mitchell, & Stafford, 2001). These factors are all similar to the changes in constraints described by Godderis and Weisbord (1998) that may encourage an institution to change control. Therefore, there may also be waves of conversion activities in mixed form markets, similar to the waves of merger and acquisition activity observed in some industries. A wave has been observed in the changes of control in the hospital industry in the 1980s and 1990s. Some were the result of merger and acquisition activity and others were the result of individual organizational choice.

**Changes in Control in Mixed-Form Markets**

As one example of a mixed-form market, conversions in the hospital industry in the United States have resulted in an extensive literature on changes in control. However, similar conversions in postsecondary education have not received the same level of analysis in the literature.

The hospital industry saw widespread change of control activity in the 1980s and 1990s with an average of 1% of hospitals converting each year (Needleman, Chollet, & Lamphere, 1997). Many hospital conversions were the result of merger and acquisition activity. Unfortunately, similar information has not yet become available with regard to these same changes in the field of postsecondary education.

Merger and acquisition activity in the hospital industry peaked in the mid-1990s as a result of changing payment arrangements and increased enrollment in managed care plans (Cuellar & Gertler, 2003; Young & Desai, 1999). This lead to the need for increased size to negotiate better rates with payers (Harrison, McCue, & Wang, 2003). Constraints on
Medicare reimbursements and a shrinking inpatient market (Young & Desai, 1999) also created conditions favorable to mergers and acquisitions. The merger and acquisition activity slowed in the late 1990s when constraints changed including the increased public scrutiny of the conversion of not-for-profit hospitals to for-profit status and subsequent legislation in many states allowing additional state level oversight of such conversions. More than 30 states passed laws calling for increased scrutiny of deals between not-for-profit and for-profit hospitals to ensure proper handling of charitable assets (Bellandi, 1999). Antitrust activity (FTC) reinvigorated review of and challenge to hospital mergers and other transactions (Cuellar & Gertler, 2003).

Literature on mergers in higher education focus on countries such as South Africa and Australia as well as Great Britain where the government encouraged consolidation in the late 1990s. However, some of these countries do not have well established mixed-form markets of postsecondary education. Many of the articles focus on human resource and organizational culture issues related to mergers rather than causes of the changes (Harman, 2002; Harman & Meek, 2002; Rowley, 1997). The literature does not contain specific mentions of changes in control of United States based institutions.

**Methodology**

Data are gathered annually from all Title IV participating postsecondary institutions in the United States by the National Center for Education Statistics. These data are available through the Integrated Postsecondary Education Data System (IPEDS) database. Data on the institutional control of each postsecondary institution were gathered from IPEDS for the years 1993 to 2007. These data were matched by unit ID so that a change in control could be identified from one year to the next. When possible, each change was confirmed through additional research. This included the Carnegie classifications; however, current Carnegie classifications are based upon 2003–2004 data so this step was only useful for the earlier years in the study. Institutions that were missing control data for one year
Changes in Control in Mixed Form Markets

Changes in control in mixed form markets were not included in the totals for that year or the next year. No data were released by IPEDS for the year 1999, so that year is omitted from the study. Therefore, the total changes listed for 2000 include 2 years of cumulative changes. We identified 265 institutions that changed control at some point during the study timeframe.

**Results**

The results in Table 2 show that less than .4% of all institutions in the United States changed control each year of the study. While the total number of institutions converting each year is relatively small and consistent, the trends in direction of conversion over time provide stronger insight into changes within the industry. The total number of institutions converting from for-profit to not-for-profit, 93, is similar to the number converting from not-for-profit to for-profit, 90. However, from 1994 to 2002 most conversions were from for-profit to not-for-profit. From 2003 to 2007, most conversions were from not-for-profit to for-profit. The trend is extreme in 2007 where there are no other conversions except 16 from not-for-profit to for-profit control. While some of the institutions that changed control in this study are two-year institutions or less-than-two-year vocational institutions, recent changes have included Grand Canyon University, Ashford University (formerly known as Franciscan University of Iowa), and Heald Colleges.

**Discussion**

While the total number of conversions may lead to the conclusion that no form of control offers significant advantages over any other, the trends over time suggest that in the past not-for-profit control offered advantages, while more recently for-profit control may offer advantages including access to capital for quick growth while still being eligible for federal student aid on a nearly equal basis with other providers.

Operational distinctions between institutions of different forms may be limited as the educational offerings and educational models of each
**Table 2.** Changes in Control of Postsecondary Institutions 1994–2007.

<table>
<thead>
<tr>
<th>New Control</th>
<th>Year</th>
<th>Public</th>
<th>Public</th>
<th>Not-for-profit</th>
<th>For-profit</th>
<th>Not-for-profit</th>
<th>For-profit</th>
<th>Change Control</th>
<th>Institutions</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>1994</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>17</td>
<td>4</td>
<td>4</td>
<td>9956</td>
<td>9989</td>
<td>.33%</td>
</tr>
<tr>
<td>Public</td>
<td>1995</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>9956</td>
<td>9958</td>
<td>.02%</td>
</tr>
<tr>
<td>Public</td>
<td>1996</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>1</td>
<td>10</td>
<td>9668</td>
<td>9693</td>
<td>.26%</td>
</tr>
<tr>
<td>Public</td>
<td>1997</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>16</td>
<td>1</td>
<td>6</td>
<td>9573</td>
<td>9604</td>
<td>.32%</td>
</tr>
<tr>
<td>Public</td>
<td>1998</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>0</td>
<td>3</td>
<td>9594</td>
<td>9611</td>
<td>.18%</td>
</tr>
<tr>
<td>Public</td>
<td>2000</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>11</td>
<td>0</td>
<td>10</td>
<td>9195</td>
<td>9225</td>
<td>.33%</td>
</tr>
<tr>
<td>Public</td>
<td>2001</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>11</td>
<td>1</td>
<td>6</td>
<td>9435</td>
<td>9461</td>
<td>.27%</td>
</tr>
<tr>
<td>Public</td>
<td>2002</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>7412</td>
<td>7432</td>
<td>.27%</td>
</tr>
<tr>
<td>Public</td>
<td>2003</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>14</td>
<td>6837</td>
<td>6864</td>
<td>.39%</td>
</tr>
<tr>
<td>Public</td>
<td>2004</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>6731</td>
<td>6750</td>
<td>.28%</td>
</tr>
<tr>
<td>Public</td>
<td>2005</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>6802</td>
<td>6816</td>
<td>.21%</td>
</tr>
<tr>
<td>Public</td>
<td>2006</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6879</td>
<td>6884</td>
<td>.07%</td>
</tr>
<tr>
<td>Public</td>
<td>2007</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>6889</td>
<td>6905</td>
<td>.23%</td>
</tr>
<tr>
<td>TOTALS</td>
<td></td>
<td>35</td>
<td>12</td>
<td>18</td>
<td>93</td>
<td>17</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. No data were released by IPEDS for 1999, therefore the 2000 numbers contain two cumulative years of changes in control.*
form have been adopted to some extent by the other forms of institutions. While it may be premature to speculate about the kinds of operational modifications that occur when there is a conversion of control of an institution, regulatory agencies would expect changes in board membership and a change in the primary form of financial support.

Postsecondary education is a mixed-form market that has evolved to the fifth stage of Marwell and McInerney’s model. While not-for-profit and public institutions identified the markets (stage 1) at the Baccalaureate and graduate levels of education, the for-profits identified and continue to dominate the vocational training market. However, for-profit providers have aggressively moved into the 4-year-and-above levels of education enrolling approximately 5.8 percent of students at 4-year-and-above institutions in 2004 (Fox Garrity, Garrison, & Fiedler, 2010).

The market of postsecondary education has shown growth at all levels (stage 2) with approximately 54 percent of the US population completing one or more years of college by 2008 according to the US Census Bureau (http://factfinder.census.gov) and an annual enrollment growth rate of 1.5% (Wilson, 2010). Adding to the most recent growth has been the economic recession which has encouraged enrollment of nontraditional students as they prepare for new careers.

Consistent with the third stage of Marwell and McInerney’s model, the costs of providing postsecondary education have increased dramatically driven by inflation, extraordinary inflation of energy and health-related employee benefits, the perceived need to provide an increasing array of amenities to attract and retain students (and the tuition they pay), and the growth of many institutions (Williams June, 2003).

As a result of both increasing costs to provide education and the reduction in donative resources from private donors and the government, tuition rates have risen at rates higher than the general inflation rate for several years (stage 4). This has lead to scrutiny of tuition increases by the federal government.

Also predicted in the fourth stage of Marwell and McInerney’s model, cross subsidy of students is a common practice within postsecondary education. In many cases all students on a campus are charged the same
tuition rate regardless of the major they choose or the classes they choose to enroll in. Some majors and some courses on a campus may carry substantially higher costs than others leading to a cross subsidy of one student (for example, in a gross anatomy lab science course) by a student in a less expensive course (for example, an English course). Cross subsidy of students is also common when one student pays full tuition and another student is granted an institutional scholarship (or discount) (Winston, 1999). The student paying full tuition is likely subsidizing the education of the student with the scholarship. These common practices of cross subsidy in postsecondary education may have delayed the entrance of for-profit providers into the baccalaureate and graduate levels of education since the profitability of certain programs and students may not have been readily apparent. However, recently for-profit providers have moved into these levels of education quite aggressively. For example, by 2004, more than 11% of the students at for-profit institutions were studying at the graduate level (including doctoral students), up from just 3.3% in 1993. For-profit institutions awarded 5.1% of all Master’s Degree granted in 2004, up from just .7% in 1993 (Fox Garrity et al., 2010).

With the aggressive growth of the for-profit providers, postsecondary education has reached the fifth stage of Marwell and McInerney’s model, cross-sectoral competition, where for-profits may threaten to replace not-for-profits. The size and strength of the market does not make complete replacement of not-for-profits by for-profits probable, but the evolution of the market is likely to continue on one of the three paths identified: stratified, displaced, or defended.

If this market were to become stratified under Marwell and McInerney’s model the not-for-profit and for-profit providers would both remain in the market with the not-for-profits serving lower income students with the costs subsidized by donors while the for-profits serve the wealthy who would pay full price. This is the opposite of the trends within the market currently where for-profit institutions serve more low income students than other institutions. For-profit providers received 16.6 percent of the Pell Grants (need-based grant aid) awarded in 2004 while enrolling 11 percent of the FTE students (Fox Garrity et al., 2010). This is partially
a result of the unique market feature of portable student aid in the forms of Pell Grants and subsidized student loans. The advent of these student aid programs replaced a model of direct subsidy by the government to institutions. Now the model employs a portable aid model allowing each student to decide which institution will receive the government subsidy. Currently, for-profit providers are serving the lower income students subsidized by federal government funds and the not-for-profits and publics are serving a larger portion of the higher income students who are not as likely to be subsidized by government funds.

The second and third alternatives from Marwell and McInerney’s model are more likely to occur. In a displaced market for-profit providers would push out not-for-profit providers as donations and government subsidies drop below a level where the not-for-profits can continue to operate with rising expenses and where there is growth in the market. As early as 2003, the Chronicle of Higher Education was reporting the record levels of expenses, the difficulty in attracting private donations, and decreases in government subsidies to institutions (Williams June, 2003). Portable Pell aid and the influx of returning adult students with federal assistance have created an influx of students who may not have attended postsecondary education in the past. This influx of new students with a desire to participate has fueled the already heated competition to attract students and their tuition dollars (Williams June, 2003). There are reports of cities where demand for postsecondary education outstrips the available seats in classrooms (generally referring to public institutions) such as Sacramento, California. These regions have been referred to as “fertile ground for a for-profit revolution” in the title of an article by Keller (2010) due to tremendous unmet demand driven by the limited funding for public postsecondary educational opportunities.

However, similar to the hospital industry in the 1980s and 1990s (Goddeeris & Weisbrod, 1998) there may be a general issue of overcapacity in the postsecondary education market even though the seats may be limited in the public institutions. In 2005, there was more than 1 seat available for every minimally college qualified graduate in the United States.
Overcapacity in the hospital industry has been cited as one cause of consolidation (Andrade et al., 2001; Goddeeris & Weisbrod, 1998).

While it is unlikely that all not-for-profit and public providers would be excluded from the market, the institutions that have changed from not-for-profit to for-profit control and the rapid growth of student enrollment at for-profit providers provide evidence that the displaced model may be the new state of the market.

There is also evidence that the third form of market competition is emerging. In a defended market the not-for-profit and public providers fight back against the entry and growth of the for-profit providers. According to Marwell and McInerney (2005), the grounds used would often be those of fundraising, legitimacy, and regulation.

One form of legitimacy enjoyed by most not-for-profit and public institutions is regional accreditation. Many for-profit institutions hold national accreditation which is granted by different bodies with different standards. Many regionally accredited, not-for-profit and public institutions will not accept transfer credits from nationally accredited institutions. However, some for-profit institutions have been granted regional accreditation, particularly by the North Central Association of Colleges and Schools which is considered to be the regional accrediting body most friendly to for-profit providers. In particular, Kinser (2007) notes that publicly traded for-profit institutions have sought out regional accreditation as a “mark of legitimacy” (p. 243). There are also reports of for-profit providers acquiring regionally accredited not-for-profit institutions specifically for the value of gaining regional accreditation (Glader, 2009). One specific example is the Jack Welch online MBA program which is a component of a formerly not-for-profit, regionally accredited institution acquired by a for-profit organization (Glader, 2009). After an acquisition, a regional accrediting body reviews the new institution to determine whether to continue the accreditation, but generally in the absence of extreme changes in curriculum or faculty, the accreditation is maintained. However, within the past two months, there has been increased scrutiny of this process with Senator Durbin, Assistant Majority Leader of the Senate, specifically urging that
accrediting bodies no longer allow for-profit colleges to acquire accreditation by purchasing not-for-profit institutions (Field, 2010).

Other evidence of a defended market is the constant struggle within Washington, DC related to the specific laws such as the Higher Education Act as renewed. During the most recent renewal process, the for-profit providers waged a strong battle to have some of the regulatory restrictions specific to for-profits removed, while not-for-profits and publics fought hard to increase those same restrictions. The result was a loosening of the restrictions without a complete abandoning of the distinctions between the sectors of institutions.

Media coverage of changes in control, while limited, suggest that the trend observed in this data of conversions to for-profit control is continuing. The authors have gathered data on twelve pending or completed acquisitions during 2009 and the early months of 2010. These include ten where the acquirer is for-profit and two where the acquirer is public.

The predictions of the future path of the conversions in postsecondary education may be informed by the past path of hospital industry conversions. In the hospital industry the initial targets of acquisition bids during 1992–3 were hospitals in dire financial straits, however by 1995–6 the acquired hospitals were financially successful institutions (Phillips, 1999). Current acquisition targets in education are financially troubled institutions (Blumenstyk, 2010). Further research is suggested to determine if more financially solvent institutions become the target of future acquisitions and conversion activity in postsecondary education.

Another relevant change in the hospital industry that should be monitored in the postsecondary education industry is the shift in public perception of for-profit and not-for-profit hospitals. Reports of fraudulent practices at for-profit hospitals adversely affected public opinion in the mid-1980s; however, by 2002 a majority of those surveyed believed that for-profit hospitals provided higher quality care while not-for-profit hospitals had lower costs (Schlesinger, Mitchell, & Gray, 2004). Several instances of fraudulent practices at for-profit postsecondary institutions have been reported over the past 5 years. If the trends in the hospital
industry hold true, those incidents may soon be forgotten by the general public. While the perceptions of quality shift, perceptions of price may as well. Currently the for-profit postsecondary institutions charge tuition that is between the average public and not-for-profit tuition rates. Any changes in the relative price structure and public opinion should be monitored.

Hospital conversions were a result of three major forces according to Goddeeris and Weisbord (1998). One factor was changes in constraints such as tax laws, regulations, and the availability of private donations and government grants and contracts. Additionally, cross subsidiation was common until third party payers moved toward standardized payment rates and active price competition. Third, overcapacity within the hospital industry lead to consolidation in healthcare. All three of these circumstances currently exist within the postsecondary education industry, leading to the conclusion that conversions of postsecondary institutions will most likely continue.

In addition to the trends observed in the hospital industry, there are aspects which are unique to the educational environment. Some aspects worthy of future research are the relationships between conversions and the predominance of online versus classroom course delivery, the expenditures and effort required to meet and maintain accreditation standards, and the ratio of instructional to overall costs. Each of these factors may influence conversion decisions or outcomes.

**Conclusion**

Conversions of postsecondary institutions are expected to continue in the future. Most changes are predicted to be to for-profit control because the dominant direction of changes is guided by current constraints which make certain forms of control more appealing.

Within the mixed-form market of postsecondary education, the pathway that will define future competition may take the form of stratified, displaced, or defended. Currently the market is stratified, although in the opposite direction than Marwell and McInerney’s model would
predict. While some not-for-profit providers may be displaced by the increased competition for students, the current market is also marked by characteristics of a defended market. Whether the defense will be successful or not will determine the future course of the market of post-secondary education in the United States.
REFERENCES


Changes in Control in Mixed Form Markets


Governance consists of the “processes by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them” (World Bank, 2006). We hypothesize that the World Governance Indicators (WGI) of voice and accountability, political stability, government effectiveness, regulatory effectiveness, rule of law and control of corruption contribute to National Per Capita Income (NPCI) weighted by the nation’s ability to maintain environmental sustainability (weighted NPCI). Weighted NPCI is a new dependent variable intended to measure a nation’s ability to co-manage economic concerns with efforts to maintain their environment. In a study of 142 nations, we found that WGI dimensions consistently predicted weighted NPCI from 2003 to 2005. We discuss implications of these findings and future research.

**Keywords:** environmental sustainability, national per capita income, world governance indicators.

During the last two decades, there has been more emphasis placed on a nation ability to increase wealth and increase effectiveness. Arndt and Oman (2006) propose that this increased emphasis is driven by increased foreign investment in developing countries (e.g., minimize risk by investing in countries that are politically stable and effective) and the decision by the World Bank to provide aid to countries with effective governments.
During the same time period, environmental sustainability increased in importance as issues of environmental degradation, global warming and pollution and waste gained prominence (Melville, 2010; Dangelico & Pujari, 2010; Haines & Reichman, 2008). Clearly, effective government is needed to improve the quality of life of a country’s citizens with environmental sustainability required for long term survival. The importance of a nation’s ability to prosper and protect the environment increases the need to develop governance indictors that differentiate among nations. Governance consists of the “processes by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them” (World Bank, 2006). We hypothesize that effective governance of political, natural, economic, and human resources contribute to a country’s economic performance and its ability to protect its environment.

Huynh and Jacho-Chávez (2009) and Malik (2002) each found significant relationships between effective governance and economic growth. Meon and Sekkat (2004) found that the effectiveness of a country’s institutions is related to the participation of Middle East and North African countries in the world economy. Kaufmann and Kraay (2002) found that per capita income and governance quality are positively related. On a corporate level, Klapper and Love (2004) found that better governance is correlated with better operating results and market valuation.

Countries’ WGI scores constitute the aggregate views of think tanks, non-governmental organizations, international organizations, and citizen and expert survey respondents in both industrial and developing countries (World Bank, 2006). From 1996 to 2007, the World Bank has collected data on 212 countries drawn from 35 independent data sources and 32 organizations around the world (Kaufmann, Kraay & Mastruzzi, 2008). Research associated with the World Bank Project has identified six world governance indictors (Kaufmann et al., 2008):

1. Voice and Accountability (VA): measuring perceptions of the extent to which a country’s citizens are able to participate in
selecting their government, as well as freedom of expression, freedom of association and a free media.

2. Political Stability and Absence of Violence (PS): measuring perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence or terrorism.

3. Government Effectiveness (GE): measuring perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, and the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies.

4. Regulatory Quality (RQ): measuring perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

5. Rule of Law (RL): measuring perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular, the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

6. Control of Corruption (CC): measuring perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests.

Research has tested the relationship between countries’ WGI dimensional scores and economic productivity and growth. Using the WGI dimensions, Huynk and Jacho-Chavez (2009) found that the voice and accountability, political stability and rule of law were significantly correlated with economic growth. Their findings supported past research that found positive relationships between the quality of governance and per capita income (Kaufmann & Kraay, 2002).

Rios-Morales, Gamberger, Smuc and Azuaje (2009) found that low political instability, the presence of rule of law and lack of corruption was related to foreign investor perception that political risk is low in developing countries. That is, foreign investment in a county is contingent on
investors’ perception of expected return on investment given the political risk of doing business in that specific country (Rios-Morales et al., 2009). These authors define political risk as the likelihood that the political climate in a foreign country will deteriorate such that company objectives are threatened. Activities that tend to increase the perception of political risk include government takeovers, civil disorder, and poor relations with other countries (Rios-Morales et al., 2009). High political risk can adversely influence foreign investment and business activities, and political risk is often assessed before making foreign investments (Khanna, Palepu, & Jayant, 2005; Oetzel, 2005).

Bris, Brisley, and Cabolis (2008) studied cross border mergers where the target firm (acquired firm) adopted the governance and accounting principles of the acquiring firm. Their study spanned mergers from 1990–2001 across 39 industries and 41 countries. These authors found that shareholder value increased when target companies adopted the superior governance practices of the acquiring firm (measured by the acquiring firm country’s WGI score). Studies have indicated that increased shareholder value can spillover to other firms in the same industry and same country even when the other firms are not involved in the cross border merger (Martynova & Renneboog, 2008; Bris & Cabolis, 2008).

Several studies have explored the control of corruption and rule of law WGI dimensions. Anokhin and Schulze (2009) analyzed data from 64 countries, and found that there were significant relationships between control of corruption, innovation and entrepreneurship. They reasoned that economic growth and development is possible when investors believe that government can impartially enforce law and the rules of trade. Meon and Sekkat (2004) found that high levels of corruption serve as a barrier to economic growth.

The validity and use of governance indicators such as the WGI have been debated (Van de Walle, 2006; Malik, 2002). Devarajan and Johnson (2008) notes that the WGI is a defensible measure of governance because it focuses on “rules on the ground” (how institutions actually operate) as opposed by “rules on the books” (how institutions are
supposed to operate as depicted in official documents). Devarajan and Johnson (2008) also note that the WGI was derived from a number of diverse sources (e.g., experts and surveys). While recognizing the value of the WGI for cross-country comparisons, Devarajan and Johnson (2008) suggested that the WGI can be improved by being more sensitive to country specific phenomenon. For example, these authors point out that Bangladesh has poor governance ratings but respectable economic growth. Non-government organizations (NGO) or civil societies may deliver services typically done by the government (e.g., health and education).

There exists little empirical research that investigates the relationship between national governance effectiveness and environmental sustainability. Drawing from a model first proposed by Tricker (1994), Reed (2002) drew parallels between corporate and national governance. Using a stakeholder approach, Reed (2002) proposed that nations, like corporations, serve a governance role that involves monitoring progress towards national goals. The nation takes the constraints affecting its multiple stakeholders into account. For example, corporations strive to maximize shareholder wealth, but may do so within the constraints of the community requirement to create wealth in an environmentally sustainable manner. Unfortunately, empirical evidence for such an assertion is not available. In the absence of empirical research, we speculate that countries with strong governance are more apt to have laws and require companies to act in environmentally responsible ways (e.g., protect air and water quality). Additionally, improved economics may lead citizens to be more concerned with environmental issues and, thus, encourage government to develop stronger laws to protect the environment. As the wealth of citizens improves, their priorities may shift from survival needs to environmental concerns. Citizens may then pressure governments for stronger environmental laws and policies. Studies suggest that developing economies may follow a sequence in which pollution of the environment rises in the early stages of growth when incomes are low. As economic wealth of citizens improves, pollution reaches a peak
and eventually decreases, even as GDP continues to rise (Nordstrom & Vaughan, 1999). With greater societal affluence there tends to be more education as survival needs decline in importance. Preserving environmental quality assumes a higher priority. With economic development governments tend to grow stronger and more democratic, and more responsive to the demands of citizens for environmental improvement and pollution reduction. Improved governance with respect to the environment may result with countries responding to citizen demands by enacting stronger environmental laws and policies (Park, Russell, & Lee, 2007).

Hypotheses

Previous research has explored the relationship between WGI and economic indicators (e.g., gross capita income, foreign investment). Tribunella & Friedman (2010) proposed a model that incorporates both national economic and environmental needs. They also asserted that productivity and growth must be balanced with environmental sustainability. Economic growth in the absence of concern for the environment is not sustainable. On the other hand, concern for the environment in the absence of developing national wealth is neither desirable nor practical. Porter and Linde (1995) also pointed out that economic activity that increases efficiency might lead to a more sustainable environment. A perfect world would be both clean and prosperous. We build on work conducted by Tribunella and Friedman (2010) by exploring correlates of a new dependent variable. The purpose of this study is to ascertain the relationship between WGI dimensions and labor productivity (national per capita income) weighted by environmental sustainability (Environmental Sustainability Index).

Hypothesis 1: There will be a significant positive relationship between countries’ Voice and Accountability (VA) and their weighted NPCI, NPCI and ESI.

Hypothesis 2: There will be a significant positive relationship between nations’ Political Stability and Absence of Violence (PV) and their weighted NPCI, NPCI and ESI.
Hypothesis 3: There will be a significant positive relationship between nations’ Government Effectiveness (GE) and their weighted NPCI, NPCI and ESI.

Hypothesis 4: There will be a significant positive relationship between nations’ Regulatory Quality (RQ) and their weighted NPCI, NPCI and ESI.

Hypothesis 5: There will be a significant positive relationship between nations’ Rule of Law (RL) and their weighted NPCI, NPCI and ESI.

Hypothesis 6: There will be a significant positive relationship between nations’ Control of Corruption (CC) and their weighted NPCI, NPCI and ESI.

**Method**

**Sample**

National productivity is measured as National Per Capita Income (NPCI). We obtained 217 nation’s NPCI from the Nation Master database (NationMaster, 2010). The Yale Center for Environmental Law and Policy (YCELP) and the Center for International Earth Science Information Network (CIESIN) of Columbia University, in collaboration with the World Economic Forum and the Joint Research Centre of the European Commission collects and computes the Environmental Sustainability Index (SEDAC, 2010). Benchmarking National Environmental Stewardship (2010) contains a detailed description of the statistical methodology used to compute the ESI. For a detailed description of these variables, please see Tribunella and Friedman (2010). The authors obtained World Governance Index indictors from data collected by the World Bank (2006).

**Analysis**

The dependent variables are NPCI, ESI, and the cross-product between NPCI and ESI. This latter dependent variable weighs each nation’s NPCI by their environmental sustainability index (weighted NPCI). We analyzed the data at the national level, and used 2004 data for the dependent
variables (2004 is the most recent ESI data available). The WGI dimensions are normally distributed with a mean of zero and a standard deviation of one. Higher WGI scores correspond to better outcomes (Kaufmann et al., 2008). To test for robustness, we conducted analyses for 2003, 2004 and 2005. We computed Pearson correlations between the dependent variables (weighted NPCI, NPCI and ESI) and independent variables. We then regressed the dependent variables onto the WGI indicators separately for 2003–2005.

**RESULTS**

Table 1 contains the means and standard deviations for the weighted NPCI and the WGI independent variables. WGI means and standard deviations are not zero and one, respectively, due to missing data.

Table 2 contains the intercorrelations between the weighted NPCI and the WGI independent variables. The WGI dimensions are strongly intercorrelated ($p < .001$). Each WGI dimension is also strongly related with the weighted NPCI in 2003, 2004 and 2005 ($p \leq .001$). The results therefore support hypotheses 1–7 on a univariate level.

Table 3 contains the results of three regression analyses where the weighted NPCI was regressed on the 2003, 2004 and 2005 WGI dimensions. Government Effectiveness and Control of Corruption standardized beta weights were moderately related in all three years, and Regulatory Quality was significant in 2003 and 2005.

As expected, there was high multicollinearity among the independent variables in each regression analysis. This was anticipated given the strong relationships among the independent variables (see Table 2). The results of the regression analyses are therefore directional but not conclusive.

NPCI and ESI were also regressed separately on the WGI dimensions (Table 4). In 2003, 2004 and 2005, WGI dimensions explained a significant amount of the variance in ESI and NPCI ($R^2 = .80, .79$ and $.78$, respectively, $p \leq .001$). However, the regression analyses revealed different results than reported for the weighted NPCI analysis reported above.
### Table 1. 2003–2005 Means and standard deviations for Weighted National Per Capital Income and World Governance Indicators (N = 142).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Sustainability Index (ESI)</td>
<td>49.86</td>
<td>8.55</td>
<td>49.86</td>
<td>8.55</td>
<td>49.86</td>
<td>8.55</td>
</tr>
<tr>
<td>National Per Capita Income (NP CI)</td>
<td>11095.29</td>
<td>11973.42</td>
<td>11095.29</td>
<td>11973.42</td>
<td>11095.29</td>
<td>11973.42</td>
</tr>
<tr>
<td>Weighted NPCI (ESI \times NPCI)</td>
<td>596617.17</td>
<td>710955.00</td>
<td>596617.17</td>
<td>710955.00</td>
<td>596617.17</td>
<td>710955.00</td>
</tr>
<tr>
<td>Voice and Accountability</td>
<td>-.13</td>
<td>1.02</td>
<td>-.11</td>
<td>1.04</td>
<td>-.14</td>
<td>1.02</td>
</tr>
<tr>
<td>Political Stability</td>
<td>-.23</td>
<td>.93</td>
<td>-.25</td>
<td>.93</td>
<td>-.21</td>
<td>.97</td>
</tr>
<tr>
<td>Government Effectiveness</td>
<td>-.07</td>
<td>1.01</td>
<td>-.04</td>
<td>1.02</td>
<td>-.01</td>
<td>1.00</td>
</tr>
<tr>
<td>Regulatory Quality</td>
<td>-.09</td>
<td>.98</td>
<td>-.06</td>
<td>.99</td>
<td>-.05</td>
<td>.97</td>
</tr>
<tr>
<td>Rule of Law</td>
<td>-.17</td>
<td>.99</td>
<td>-.15</td>
<td>1.00</td>
<td>-.16</td>
<td>1.01</td>
</tr>
<tr>
<td>Control of Corruption</td>
<td>-.12</td>
<td>1.01</td>
<td>-.10</td>
<td>1.03</td>
<td>-.06</td>
<td>1.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>ESI</th>
<th>NPCI</th>
<th>ESI x NPCI</th>
<th>VA</th>
<th>PS</th>
<th>GE</th>
<th>RQ</th>
<th>RL</th>
<th>CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESI</td>
<td>1.00</td>
<td>.42</td>
<td>.56</td>
<td>.55</td>
<td>.52</td>
<td>.52</td>
<td>.51</td>
<td>.50</td>
<td>.54</td>
</tr>
<tr>
<td>NPCI</td>
<td>1.00</td>
<td>.97</td>
<td>.74</td>
<td>.66</td>
<td>.87</td>
<td>.79</td>
<td>.85</td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td>ESI x</td>
<td>1.00</td>
<td>.79</td>
<td>.87</td>
<td>.87</td>
<td>.85</td>
<td>.91</td>
<td>.85</td>
<td>.84</td>
<td></td>
</tr>
<tr>
<td>NPCI</td>
<td>1.00</td>
<td>.70</td>
<td>.85</td>
<td>.85</td>
<td>.84</td>
<td>.85</td>
<td>.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VA</td>
<td>1.00</td>
<td>.77</td>
<td>.71</td>
<td>.81</td>
<td>.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td>1.00</td>
<td>.94</td>
<td>.96</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE</td>
<td>1.00</td>
<td>.77</td>
<td>.71</td>
<td>.81</td>
<td>.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ</td>
<td>1.00</td>
<td>.93</td>
<td>.96</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RL</td>
<td>1.00</td>
<td>.96</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>1.00</td>
<td>.96</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESI</td>
<td>1.00</td>
<td>.42</td>
<td>.56</td>
<td>.56</td>
<td>.53</td>
<td>.52</td>
<td>.51</td>
<td>.50</td>
<td>.54</td>
</tr>
<tr>
<td>NPCI</td>
<td>1.00</td>
<td>.76</td>
<td>.68</td>
<td>.88</td>
<td>.80</td>
<td>.86</td>
<td>.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESI x</td>
<td>1.00</td>
<td>.72</td>
<td>.85</td>
<td>.85</td>
<td>.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPCI</td>
<td>1.00</td>
<td>.73</td>
<td>.84</td>
<td>.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VA</td>
<td>1.00</td>
<td>.76</td>
<td>.73</td>
<td>.81</td>
<td>.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td>1.00</td>
<td>.94</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE</td>
<td>1.00</td>
<td>.77</td>
<td>.76</td>
<td>.82</td>
<td>.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ</td>
<td>1.00</td>
<td>.93</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RL</td>
<td>1.00</td>
<td>.96</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>1.00</td>
<td>.96</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESI</td>
<td>1.00</td>
<td>.42</td>
<td>.56</td>
<td>.56</td>
<td>.50</td>
<td>.53</td>
<td>.52</td>
<td>.50</td>
<td>.53</td>
</tr>
<tr>
<td>NPCI</td>
<td>1.00</td>
<td>.73</td>
<td>.68</td>
<td>.87</td>
<td>.80</td>
<td>.85</td>
<td>.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESI x</td>
<td>1.00</td>
<td>.73</td>
<td>.85</td>
<td>.84</td>
<td>.84</td>
<td>.84</td>
<td>.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPCI</td>
<td>1.00</td>
<td>.78</td>
<td>.76</td>
<td>.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VA</td>
<td>1.00</td>
<td>.94</td>
<td>.96</td>
<td>.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td>1.00</td>
<td>.93</td>
<td>.96</td>
<td>.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE</td>
<td>1.00</td>
<td>.96</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ</td>
<td>1.00</td>
<td>.96</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RL</td>
<td>1.00</td>
<td>.96</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>1.00</td>
<td>.96</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*All correlations are significant at the $p \leq .001$ level.
In 2003, 2004, and 2005 only, Government Effectiveness predicted NPCI (i.e., had a significant beta weight). When ESI was the dependent variable, Voice and Accountability, Political Stability, Rule of Law and Control of Corruption consistently had significant beta weights in 2003, 2004 and 2005.
Table 4. Environmental Sustainability Index and National Per Capita Income regressed on WGI dimensions.

<table>
<thead>
<tr>
<th>Year</th>
<th>ESI</th>
<th>NPCI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$t$</td>
</tr>
<tr>
<td>2005</td>
<td>Voice and Accountability</td>
<td>.42</td>
</tr>
<tr>
<td></td>
<td>Political Stability</td>
<td>.32</td>
</tr>
<tr>
<td></td>
<td>Government Effectiveness</td>
<td>-.13</td>
</tr>
<tr>
<td></td>
<td>Regulatory Quality</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Rule of Law</td>
<td>-.76</td>
</tr>
<tr>
<td></td>
<td>Control of Corruption</td>
<td>.78</td>
</tr>
<tr>
<td></td>
<td>$R^2$</td>
<td>.38, $F_{(6, 135)} = 13.85 \ (p \leq .001)$</td>
</tr>
<tr>
<td>2004</td>
<td>Voice and Accountability</td>
<td>.47</td>
</tr>
<tr>
<td></td>
<td>Political Stability</td>
<td>.32</td>
</tr>
<tr>
<td></td>
<td>Government Effectiveness</td>
<td>.14</td>
</tr>
<tr>
<td></td>
<td>Regulatory Quality</td>
<td>-.13</td>
</tr>
<tr>
<td></td>
<td>Rule of Law</td>
<td>-.74</td>
</tr>
<tr>
<td></td>
<td>Control of Corruption</td>
<td>.57</td>
</tr>
<tr>
<td></td>
<td>$R^2$</td>
<td>.38, $F_{(6, 135)} = 14.25 \ (p \leq .001)$</td>
</tr>
<tr>
<td>2003</td>
<td>Voice and Accountability</td>
<td>.43</td>
</tr>
<tr>
<td></td>
<td>Political Stability</td>
<td>.24</td>
</tr>
<tr>
<td></td>
<td>Government Effectiveness</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Regulatory Quality</td>
<td>.08</td>
</tr>
<tr>
<td></td>
<td>Rule of Law</td>
<td>-.87</td>
</tr>
<tr>
<td></td>
<td>Control of Corruption</td>
<td>.73</td>
</tr>
<tr>
<td></td>
<td>$R^2$</td>
<td>.34, $F_{(6, 135)} = 13.60 \ (p \leq .001)$</td>
</tr>
</tbody>
</table>
CONCLUSION

Previous research showed that WGI were related to economic indicators on the national level. The extant literature contains little empirical evidence that World Governance Indictors predict a nation’s ability to protect its environment. The conditions under which a nation creates wealth and protects its environment has not been studied. An understanding of the antecedents of a nation’s ability to co-manage the need to create wealth with environmental protection is important for several reasons. One could argue that a goal of government is to increase the quality of life of its citizens. Increases in a nation’s wealth may increase the quality of life by way of increased individual income, more employment opportunities, greater availability of goods and services, and better educational systems. Quality of life may be problematic; however, without a concern for the environment. Economic wealth in the absence of clean air, water and other environmental protections (e.g., renewable resources) is not sustainable and ultimately leads to deteriorating health for all citizens. This research suggests that economic wealth and environmental governance may be related. As economic wealth improves there may be a shift in the priorities of developing nations and their citizens from survival needs to concern for environmental regulation. Stronger government laws and regulation with respect to the environment may result as citizens become more concerned with environmental sustainability.

This research shows that WGI dimensions are associated with a nation’s ability to co-manage economic concerns (NPCI) with maintenance of its environment (ESI). A nation’s ability to co-manage NPCI and environmental sustainability is contingent upon its ability to provide freedoms to its citizens (VA), maintain political stability and curb violence, and provide a high quality of public services independent of political pressure. Weighted NPCI is also associated with a nation’s ability to implement sound policies and regulations that permit and promote private sector development, control corruption, and have citizens that abide by the rules of society (e.g., contract enforcement, property rights, police, and courts).
Research Limitations

Environmental sustainability measured by the ESI has several limitations. First, the data is perceptual and, therefore, subject to the usual measurement errors associated with survey responses that rely on respondents’ perceptions. We direct readers to Kaufmann, Kraay and Mastruzzi’s (2008) detailed review of the methodology employed to calculate ESI. Second, future research should use a more current measure of environmental sustainability. Siche, Agostinho, Ortega and Romeiro (2008) concluded that a completely satisfactory sustainability index has yet to be developed. After a review of five sustainability indices, Giannetti, Almeida and Bonilla (2010) concluded that the different indices they studied arrived at varying interpretations for the Mercosur nations (Argentina, Brazil, Uruguay and Paraguay). These authors concluded that there is a “need for more standardized metrics that give transparent results” (Giannetti, Almeida & Bonilla, 2010).

The multicollinearity issues limit the regression analyses’ conclusions. Future research should test independent variables that are not as highly intercorrelated. Third, the model tested addresses political and social variables but may suffer from omitted variable bias. Future research should include additional variables that measure capital, labor, and productivity for a given economy.

Future research

While this study is a sound beginning, future research should focus on a deeper understanding of the relationship between economic concerns and environmental sustainability. For example, as a nation’s NPCI grows, citizens may turn their attention from economic survival to other concerns like environmental sustainability. As citizens become more concerned with the environment, they may lobby for better laws to promote environmental sustainability. These and other linkages between WGI, NCPI, and environmental sustainability need to be explored in future research.
In order to build NPCI and maintain its environment, nations should consider its standing with respect to the WGI dimensions. Political decision-making that place high priority on initiatives that improve a nation’s ability to govern effectively, provide for economic concerns and environmental preservation is likely to improve the lives of its citizens.
REFERENCES


Throughout 2009 and early 2010 U.S. healthcare was involved in a huge power struggle with special interest groups lobbying to retain their profit margins, the Democrats trying to get their bill passed and the Republicans opposing every Democrat move in that direction to regain seats in both houses in November 2010. How did profit motive of special interest groups impact health reform? How did traditional market forces or government forces impact health reform? How was the welfare of the uninsured addressed while select groups argued over the extent to which they would have to cut into profits? This article addresses these quandaries by examining six major health care industry special interest groups sitting at the Obama bargaining table. These groups include pharmaceutical manufacturers, medical equipment companies, health care insurers, hospitals, physicians and employers. It examines the deals that were made to contribute toward paying for health reform while protecting current profits. A price/cost volume breakeven analysis (present and potential) is estimated for these special interest groups to illustrate the fears and the response including extensive lobbying in 2009.

**INTRODUCTION**

The Democrats’ desire for universal access to health insurance runs deep. President Obama promised health care reform including coverage for the uninsured and stated after his election such reform was his number three priority behind resolution to the financial crisis and energy independence. President Franklin D. Roosevelt issued the first call for
national health care (Miller, 2010) and unsuccessfully hoped to include such an insurance program in Social Security in 1935. Later in his presidency, his staff prepared a plan with the expectation of making health care reform his next crusade. However, he died before he could bring his plan forward. President Truman (1945–1953) supported the concept and made his stance clear by recommending the establishment of a universal health insurance program (Mayes, 2004). Every Democratic president and several Republican presidents have wanted to provide affordable coverage to more Americans. President Clinton offered the most ambitious proposal and suffered the most spectacular failure. One of the most significant differences between the Clinton and Obama efforts is that employers and business groups, alarmed at the soaring cost of health care, were among the advocates for the Obama change. Insurance companies began by saying they accepted the need for change and wanted a seat at the table. As the bills developed, however, they became strong opponents of some Democratic proposals, especially one to create a government-run insurance plan as an alternative.

Morone (2010) sites important political lessons for future reformers to consider: Have Passion: The president must be deeply involved in order to overcome the special interests. Act with speed: Obama learned from President Johnson who said “Everyday that I am in office I am going to lose votes.” The president losses political capital as time passes. Master the Congressional Process: The Obama Administration out performed previous Democratic administrations by shepparding the bill through the process. Go Public: The Democrats decided to bring the fight with each special interest group out in the open.

On March 23, 2010, President Obama signed comprehensive health reform, the Patient Protection and Affordable Care Act, into law [PPACA; P.L. 111-148] (Lee, 2010). The legislation will do the following:

- Most individuals will be required to have health insurance beginning in 2014.
• Individuals who do not have access to affordable employer coverage will be able to purchase coverage through a Health Insurance Exchange.
• Employers will be required to pay penalties for employees who receive tax credits for health insurance through the Exchange.
• New regulations will be imposed on all health plans that will prevent health insurers from denying coverage to people and from charging higher premiums based on health status and gender.
• Medicaid will be expanded to 133% of the federal poverty level for all individuals under age 65. The 2008 Census noted that 47 million people, or 16 percent of the U.S. population, were uninsured and described as all aged groups who are self employed, working full or part time but not offered employer benefits and unemployed; non citizens; and students. The 16 percent plays a pivotal role in quantifying the potential impact on the selected special interest groups of providing coverage. Therefore, this article approximates increases in both demand and resulting revenues to each special interest group by 16% (Mendes 2010).

Public Policy Process as Backdrop for Health Reform Debates Past and Present
According to Longest (2006) the public policy process is a cyclical series of events. The basic framework is problem definition; formulation and analysis of solution alternatives; selection of a solution; implementation, which creates new problems; new problem definition; formulation and analysis of new solution alternatives; selection and implementation of a new solution; and on and on. One only has to examine the long history of alterations to the original Medicare legislation to demonstrate how incremental changes have been made to address new problems emerging from new solutions to public policy problems. Oberlander (2007) notes that incrementalism has governed U.S. health policy with the predictable result that both health care spending and the number of uninsured Americans have reached record levels.
CURRENT PUBLIC POLICY PROBLEM

While Americans agreed with Presidents Truman, Clinton and Obama at the voting booth, some major special interest groups held differing views. Employers were worried that they will have to pay more for coverage of the uninsured. Unions did not want to give up benefits for which they have fought long and hard. The major political parties were interested in retaining or gaining votes and political power. Insured Americans did not want to give up benefits, pay more for the same benefits they already have or pay more in taxes to subsidize coverage of the uninsured. Based on these assumptions, the uninsured citizens are the winners and the other parties perceive themselves as losers to varying degrees. Feldstein (2006) states the current U.S. health care system is the one most Americans want. He also notes that most people like their current benefits and do not want to pay more premiums and taxes.

Figure 1 depicts the Pre Health Care Reform situation in which the stakeholders discussed in this article are encircled by the current tax and premium levels at 16% of the Gross Domestic Product. The special interest groups in Figure 1 were making significant profits in 2009 and did not want to give up any of those profits.

Figure 1. Pre Health Care Reform.
Figure 2 depicts the dilemma discussed in this article; the uninsured will become insured and will push tax payer stakeholders to accommodate the increase in services provided to the formerly uninsured. In Figure 2, the broader circle representing the formerly uninsured depicts the expanded set of services that the newly insured population will be demanding. The broader, outer circle represents the potential tax rate increase that could occur if costs are not controlled. Throughout the negotiation process in 2009 and early 2010, the potential tax increased loomed large in debates. This article examines the differing views and resulting market behaviors among six special interest groups defined above. Other stakeholders including unions and political parties are not addressed since they do not actually provide health care services in health care organizations and the work place.

**Figure 2. Potential Post Health Care Reform.**
Bankruptcy Likely if the Status Quo Remains

According to Oberlander (2007), there is nothing inevitable about health care reform and the status quo is deeply entrenched in health policy in the U.S. He notes that the system is remarkably resistant to change because many constituencies profit from it, a key concept in this article. National health care expenditures represent income to special interest groups. Therefore, opportunities are available to those with vested interests to block change that threatens current market status and performance. Conversely, the U.S. Congressional Budget Office (CBO, 2009) projects that the unchecked status quo of current health care cost inflation could bankrupt the country by 2035 as shown in Figure 3. The dash line A depicts the outcome of current policies if the system is not modified. The small dash line B depicts the outcome if meaningful health care reform is implemented. However, the Obama Administration asserts that health care costs overall could be brought under control by making coverage of the uninsured part of a larger health reform movement. In addition, both state and federal governments as well as individuals are already paying for uninsured patients to the tune of $44 Billion in uncompensated treatment in hospitals (McKethan et al., 2009).

The Congressional Budget Office estimates that the legislation will reduce the number of uninsured by 32 million by 2019 at a net cost of $938 billion over ten years, while reducing the deficit by $124 billion during this time period. The official Congressional Budget Office analysis does indeed indicate that the passed Bill will provide a modest deficit reduction over the next ten years. However, Holtz- Eaklin and Ramlet (2010) argue that a more comprehensive and realistic projection suggests that the new reform law will raise the deficit by more than $500 billion during the next 10 years and by nearly $1.5 Trillion in the following decade. The real question is will changes such as changing Medicare payments, bundling of medical services, and improvements in information systems and care coordination spark a productivity revolution that will make care more affordable?
HYPOTHETICAL IMPACT ON THE SPECIAL INTEREST GROUP PROFITS

All of the six highlighted special interest groups are currently earning a profit as modeled in Figure 4. Insuring 47 million more people is conservatively assumed, in the absence of any other data to the contrary, to increase demand for services by approximately 16 percent. This is roughly equivalent to the segment of the population represented by the uninsured. This number should not be confused with the 2009 level of GDP (16%) that health care is costing the U.S.

Cutler (2010) forecasts significant savings can be achieved if productivities such as changing Medicare payments, bundling of medical services, and improvements in information systems and care coordination can be implemented. Figure 5 depicts that potential savings can be achieved by reducing the administrative expenses paid to health insurers. The bill calls for an overall administrative expense average of 12% although several national insurers have demonstrated rates lower than 10 percent can be achieved. By eliminating and reducing medical errors and
**Figure 4.** Pre-Reform Break-Even Diagram for Six Major Special Interest Groups.

**Figure 5.** Post-Reform Break-Even Diagram for Six Major Special Interest Groups.
readmissions to hospitals in the first 30 days cost can be significantly reduced and the quality of care will be greatly improved.

The logical argument is that each special interest group was making significant profits before the law was passed and, as a result, the demand for their services will increase by 30 to 47 million people. Each special interest group should be making more money; therefore, why are they complaining? To understand their concerns it is instructive to analyze their costs. Figure 5 depicts the potential breakeven point for the special interest groups. Fixed costs are those that remain the same irrespective of the volume of customers such as a 16% increase in demand. Variable costs are those that increase with volume and may increase at a faster rate if the newly insured population cost more to serve. If the demand for goods and services increases by approximately 16% and the variable costs grow at the same rate, the quantity of services supplied will move from point X1 to X2 or X3; these groups will make even more profit. Prior to the passage of health care reform, special interest groups were concerned that their variable costs would increase to the point and result in an overall reduction in profits. Although concerned, they were not fighting the change because the situation in Figure 5 demonstrates that they would still make significant though smaller profits.

**Lobbying for and against Health Care Reform**

If these special interest groups are likely to continue making profits, why are they lobbying as demonstrated in Figure 6 below to maintain market position, profits or both? Is there something that is missing in post reform projections? What is worrying and motivating the special interests groups to spend $1 million per day in 2009 to influence public opinion and legislative decision makers? Is it that they are unable to pinpoint the cost of providing service to the newly insured group? The writers of this article believe the answer lies in fear of not knowing the exact point at which the projected profits could convert to losses or severely depressed profit margins.
They appear to also fear that the addition of the newly insured population will result in an exponential growth in the variable costs. Such growth in the variable costs could potentially move each group into a loss situation from which they may not be able to recover. Figure 7 depicts this unacceptable situation that worries each special interest group.

**Figure 6.** Lobbying for and against Health Care Reform.

**Figure 7.** Potential Post Reform Break-Even Diagram for Six Special Interest Groups.
**Estimated Post Reform Profit Position of Special Interest Groups**

The estimated financial impact is modeled for the selected special interest groups below. Please refer to Figure 5 to reinforce an understanding of the potential post reform financial situation of each special interest group. Fixed and variable costs are under control and each group is making smaller but significant profits. The data are presented in terms of sales and/or revenue. These writers would prefer to present all of the data in terms of profits but this is not possible due to a variety of source data (sales, revenue and cost).

**Pharmaceutical Manufacturers**

The pharmaceutical manufacturers and distributors earned $40 Billion in profits in 2007 (U.S. Pharmaceutical Industry Report, 2007–2008) on revenues in excess of $300 Billion and are operating well beyond the break-even point. With an approximate 16% increase in demand (and by association revenues) for services per year, this special interest group could earn up to $46.4 Billion in profits annually. If costs remain in the same ratio of fixed versus variable, a net increase of $6.4 Billion in profits will be achieved. The Patient Protection and Affordable Care Act makes major changes to the Medicare prescription drug benefit, reducing drug costs for many seniors and increasing rebates and other costs to the industry. These changes will affect prescription drug costs and pharmaceutical company profits. However, the changes are not likely to alter the trends already reshaping the pharmaceutical industry. The pharmaceutical industry chose to participate in the Obama reform instead of opposing it as they did in the Clinton era. They were able to avoid some potential threats to revenues and make accommodations that would limit the overall federal costs of reform. Spatz (2010) describes the changes that will occur in the industry such as consolidation, pricing pressures and competition from generics. The fate of the brand name drug companies will be tied to their ability to increase research productivity, to adapt to pricing pressures and to reduce their reliance on the U.S. market.
The Centers for Medicare and Medicaid Services, Office of the Actuary has estimated that after health care reform the total public and private pharmaceutical spending will be $3.4 Trillion. The estimates of the cost to the industry are approximately $100 Billion. In comparison to revenue of $3.4 Trillion, the impact of the health reform law is modest.

**MEDICAL EQUIPMENT MANUFACTURERS AND SUPPLIERS**

Sales of medical equipment and supplies grew approximately 16% in 2005 (Bossong, 2006). According to S&P for 2006, revenue for the medical equipment and supplies groups was expected to rise 13% to 14% in 2006 on the heels of net profit increasing from 18% to 19% in 2005. Demand for products: hospital beds, stretchers, blood analyzers, and sterilization equipment will be driven by rising patient admissions associated with the aging population. And, according to the American Hospital Association (AHA), there will be a 52% rise in spending by hospitals due to increases in the cost of such goods and services in spite of cost containment efforts. S & P also forecasted the medical equipment and supplies industry would expand over the next seven years at a compounded annual rate of 11.7%, from $63.9 billion in revenue in 2004 to $139.9 billion in 2011. Without covering the uninsured, the expected sales are projected to be $139.9 Billion. However, if there is an approximate 16% increase in demand (and by association revenues) sales are likely to swell to $143.96 Billion based on the S & P’s projections. It is assumed in light of no evidence to the contrary that fixed and variable costs are under control and each group is making smaller but significant profits and that this will remain the same into the future as the demand increases.

**HEALTH INSURERS**

U.S. health care insurers are required by state insurance departments to hold specific funds in surplus accounts called reserves to cover outstanding medial claims in the event the company goes out of business. (Consumer Federation of America, 2007). Insurance companies routinely
accumulate these reserves in excess of 200% of the required amount set by the insurance department in each state. For example, Pennsylvania required that Blue Cross and Blue Shield (BC & BS) accumulate $6.2 billion in 2005 (Lewin Group, 2005). Across the U.S., over $600 Billion are held in reserves by these health insurance companies. The size has grown to be excessive and unnecessary according to the Consumer Federation of America (2007). Since this surplus is accessible by senior health insurance executives for bonuses, sales campaigns and perks, it would be considered by many as ‘profits’ for nonprofit companies. An approximate 16% increase in demand (and by association revenues), could swell the reserves to $696 Billion. Assuming costs remain in the same ratio of fixed and variable, a net increase in ‘profits’ is $96 Billion.

**WILL MEDICARE CHANGES RESULT IN SIGNIFICANT SAVINGS?**

The comprehensive health care reform legislation [PPACA; P.L. 111-148] includes several provisions related to the Medicare program. The implementation of these changes are expected to result in significant long term savings, impact the targeted individual’s costs of care, and improve the overall quality of care. But will they?

- Phases coverage in the Medicare Part D drug benefit gap, or “doughnut hole”.
- Improves coverage of prevention benefits: Beginning in 2011, no coinsurance or deductibles will be charged in traditional Medicare for preventive services that are rated A or B by the U.S. Preventive Services Task Force (USPSTF). Medicare will cover a free annual comprehensive wellness visit and personalized prevention plan.
- Reduces federal payments to Medicare Advantage plans over time and provides bonus payments to plans receiving high quality ratings.
- Establishes a new Independent Payment Advisory Board to recommend ways to reduce Medicare spending if Medicare per capita growth rates exceed certain targets.
Includes numerous provisions related to provider payments to reduce the growth in future Medicare payments; increases payments for some primary care providers.

Includes several payment and health delivery system reforms, including a pilot program to bundle payments for post-acute care, value-based purchasing for providers and the establishment of accountable care organizations.

Modifies and expands the use of income-related premiums under Medicare.

Increases the Medicare Hospital Insurance (Part A) payroll tax on earnings for higher-income taxpayers.

HAVING AN IMPACT ON OTHER INSURERS

The law directs its major changes to Medicare but what will be the impact on other insurers? McGlynn, Cordova, Wasserman and Giroi (2010) examined 2016 scenarios and compared each with the law that passed. They divided the choices into four quadrants around the law and found only a few that would have performed better than the law. Better here is defined as covering more people at a lower government cost. However, these strategies could only be achieved by decreasing the generosity of the subsidy, by increasing the penalty for not enrolling or by providing a less generous Medicaid expansion. The study authors felt that all of these were at best politically difficult, if not infeasible.

HOSPITALS

U.S. hospitals posted a $17 billion overall profit in fiscal 2008, down 61% from the previous year, amid a punishing recession that caused a $20.5 billion reversal in healthcare providers’ investment portfolios, according to statistics from the American Hospital Association (Carlson, 2010). Hospitals collected $648 billion in operating revenue, an increase of 6.4% over the prior fiscal year. In 2007 and 2008, investment returns played
a significant role in overall profitability. In 2008, hospitals reported a $4.5 billion loss on their investments, the first time in at least 15 years that the investments lost money. In 2007, hospitals enjoyed $17 billion in non operating revenue, which exceeded the previous record by 40% and led to the highest profits on record in the hospital industry. However, even accounting for the recent investment losses, hospitals showed growth in net revenue, which includes both operating and investment sources. The net revenue of $643 billion represented 2.8% growth from the year prior, while total expenses grew by 7.4% to $627 billion. If these trends continue and hospitals experience a 16% increase in demand revenues will rise to $745.88 Billion and costs will rise to $727.32 Billion resulting in a profit of $18.56 Billion.

PHYSICIANS

Physicians and surgeons occupied 633,000 positions in 2006 (US Department of Labor, 2006). The American Medical Group Compensation and Financial Survey (2007) revealed that the average salary of physicians across 69 specialties was $289,695 with a low of $175,824 for Pediatric Allergy and a high of $530,000 for Neurological Surgery. Since estimating the salary for each physician is not easily determined, the following assumption is used to model a result. At an average income of $289,695 for 633,000 physicians, the total pre reform salary would be $182.9 Billion per year. With an increase of 16% in demand and the same ratio of fixed and variable costs, the result could be a total salary of $212.16 Billion, a net increase of $29.26 Billion.

The comprehensive health care reform legislation [PPACA; P.L. 111-148] calls for the elevation of primary care physician payments to Medicare levels. Ku (2010) states this elevation in rates to Medicare levels should increase physician willingness to serve Medicaid patients.

The legislation also includes a 21% reduction in Medicare reimbursement. When such a reimbursement reduction is modeled with an increase of 16% in demand and the same ratio of fixed and variable costs, the
physicians appear to stand to lose more than the other special interest groups in this article. However, no physician cuts have ever been implemented in history. Only time will tell.

**Employers**

While employers are not “providers “in the same sense as the other special interest groups, they still make medical services available by purchasing insurance or self insuring workers; therefore, they are just as interested in maintaining a stable ratio of fixed and variable costs to remain viable. Over the past ten years, the cost of healthcare benefits and the resulting health insurance premiums have increased dramatically. With the rising costs of health care, employers have been shifting the cost to the employees from $1543 to $3515 for families and $318 to $779 for individuals over the 1999-2009 period (Mishel, 2006). When the 16% increase in demand is applied to this cost shifting trend the rate could rise to $3748 for families and $833 for individuals annually.

**Is Anything Different This Time?**

During the latter part of 2009 and early 2010, the U.S. was involved in a huge power struggle among the six special interest groups lobbying to retain their profit margins, the Democrats trying to get their bill passed and the Republicans opposing every democrat move in that direction in order to regain seats in both houses in November 2010.

Oberlander (2007) examines similar events when the Clinton Administration attempted health care reform in the 1990s. Rising health care costs and a growing number of uninsured were the drivers for reform. Universal coverage for all, required employer contributions, no restructuring of Medicare and retention of private insurance were the same then and now. The major differences appear to be the fact that managed care dominance, regulation of the insurance industry, and national health boards to enforce cost controls were unique to the Clinton Plan.
Oberlander also points out the Clinton Plan was ‘too liberal for moderate Republicans and conservative Democrats and too conservative or liberals’. More importantly to this article, the National Federation of Independent Business and the Health Insurance Association of American vigorously opposed the Clinton Administration for seeking too much ‘big government’. While that still appears to be a theme, the special interest groups seem to be working toward a balance between concessions that send a message of cooperation while still protecting the businesses they operate.

CONCLUSION

The Kingdon policy stream and windows of opportunity to align policy problems, policy solutions and political circumstances do not stay open for long as debating parties assert power to influence decision making (Longest, 2006). Oberlander (2007) notes that the price of policy problem resolution failure is high and is exhibited as the loss of political will to do anything meaningful for some time. The Clinton Plan died in 1993, almost two decades ago. The public policy process operates in an Iron Triangle according to Longest (2006). The Executive Branch is playing the role of policy demander (health reform proposed by Candidate Obama and later by President Obama); the role of policy supplier is being played by the legislature (House and Senate bills to deliver the reform); and the special interest groups are exerting influence in the decision process. Any significant change in the composition of the policy suppliers will impact success or failure of the law. Meanwhile, Figure 5 is believed by these writers to represent the end result.

It also appears to these writers that the biggest flaws in the whole health care reform debate now and in times past is the absence of any reliable quantification of the benefits as well as the true costs of reform that will stand the test of time. These unknowns seem to fuel the rhetoric. Meanwhile, the special interests groups are trying to balance concessions and business performance.
REFERENCES


Holtz-Eakin, D., & Ramlet, M. J. (2010). Health care reform is likely to widen federal budget deficits, not reduce them. Health Affairs, 29(6), 1136–1141.


Skocpol, T. (2010). The political challenges that may undermine health reform. Health Affairs, 29(7), 1288–1292.


A Framework for the Classification of Data and Information (DIQ) Literature

M. Pamela Neely, PhD, CPA

INTRODUCTION

Quality data and information form the foundations of the information systems used to manage internal operations and external relationships within the supply chain. Service-oriented architecture (SOA) and multi-channel databases demand high quality data and information in order to be of use to decision makers who must rely on these systems. As a result, data and information quality (DIQ) has increasingly become a focus of both academic research and practitioner concern.

DIQ is emerging as an important research discipline in academic and practitioner circles. Within the academic arena, two new journals have been introduced in the last couple of years–The International Journal of Data Quality (IJIQ) and the Journal of Information and Data Quality (JDIQ). These journals are the natural evolution of the International Conference on Information Quality (ICIQ), a combined academic and practitioner conference begun in 1998. As evidenced by these emerging outlets for DIQ literature, the topic is coming to the forefront of organizations and academics.

This paper describes a research framework for classifying the existent DIQ literature. Academics build on the body of knowledge in a given field. In order to do so, they must know what comes before. A classification framework can help to distill the literature into distinct areas,

M. Pamela Neely, PhD, CPA, The College at Brockport.
promoting the opportunity for creating research questions. In addition, from a practitioner perspective, it is important to know what questions have already been answered and what areas need further exploring. The framework described in this paper can easily be understood by practitioners struggling with DIQ issues.

The paper is organized as follows. The next section reviews other literature framework classifications described for DIQ literature. Following this is a description of the PMOT (People, Management, Operations and Technology) framework. Finally, research questions are described, evolving from the PMOT framework. Conclusions and further research illustrates how the PMOT is used to classify the current literature.

**Other DIQ Research Frameworks**

Early research in Data and Information Quality (DIQ) tended to focus on the design and development of metrics, measures and definitions of DIQ. Using an “information as product” approach to classify the DIQ literature Wang, Storey and Firth (1995) describe a framework for data quality research with seven elements: management responsibilities, operation and assurance costs, research and development, production, distribution, personnel management and legal function. Very briefly, management responsibilities pertain to policies, requirements, and the data quality system. Operation and assurance costs are broken down into three areas: information systems, database, and accounting. Research and development is also focused on three areas: analysis and design of the quality aspects of data products (also semantics), incorporating data quality into the design of an information system, and R & D pertaining to dimensions and measurement. Production relates to raw data and the correctness of process vs. the correctness of the data. Distribution is moving the data through the system and deals with metadata and documentation. Personnel management is concerned with training, qualifications, and motivation. Finally, legal function deals with safety aspects as well as product liability. Classification of papers occurs by major and minor topic. Thus, a paper can appear in multiple groupings. For example, Ballou and Tayi
(1989) is found in the section on operation and assurance costs, research and development and production.

The “information as product” analogy is more fully developed in Wang (1998). The information manufacturing system (IMS) produces information products (IP) which have some value that is transferable to the consumer. Four roles are identified in the production process: information suppliers, information manufacturers, information consumers and information product managers. Additionally, the article describes the Total Data Quality Management (TDQM) concept. Modeled after the Total Quality Management (TQM) concept, the TDQM methodology has four phases: define, measure, analyze and improve. Within these phases the interrelationship of the information product itself, IP characteristics, IP quality and IMS is described.

Developing a two-by-two matrix for the classification of DIQ literature, Neely (2005) extends the “information as product” concept, adding the characteristics identified by J.M. Juran (1988) to determine fitness-for-use: 1) **Who** are the users of the product or service? 2) **How** are the users actually putting the product or service to use? 3) **What** specific determinants, from a user perspective, make a product or service fit for use? 4) What are the **economic resources** of both the producer and the user, and 5) what is the possibility and probability of any dangers to **human safety**? Selected papers are classified within this matrix. It is possible that a paper can be in more than one cell. For example, Klischewski and Scholl (2008) can be found in cells for management/what, distribution/what, distribution/economic resources, and dimensions and measurement/what.

Ge and Helfert (2007) describe a categorization method for literature based on information quality assessment, information quality management and contextual information quality. They further refine IQ assessment into a metric layer, a dimension layer and a methodology layer. Within the metric layer, they identify a two-by-two matrix mapping quality metrics from the data vs. user perspective paired with context dependency (or independency). IQ management is recognized as being the intersection of quality management, information management and knowledge management.
Papers are classified within any one of these categories. Additionally, several research questions are suggested for each major area.

Within the accounting information systems domain, Poston and Grabski (2000) examine the literature from an information lifecycle perspective. This lifecycle is comprised of data entry, data storage, data views, or overall database issues (entry, storage and views) from the physical data standpoint. The data is then used to make decisions and support action taken. Finally, a decision with respect to what data should be captured and entered into the AIS leads back to data entry. Overarching these data issues is the accountability of the management of the AIS. Underpinning the data issues is data verification, supported by internal accounting controls and auditing. This lifecycle approach is used to classify 320 papers within the AIS literature. In addition to the categorization by lifecycle, Poston and Grabski organize the AIS literature by research method and underlying theory (e.g., microeconomic, organizational behavior.)

As indicated earlier, much of the early work in DIQ is definitional in nature. Wang and Strong (1996), conclude that, from a consumer viewpoint, DIQ is multi-dimensional. Using surveys and factor analysis, they suggest that there are four categories of DIQ: intrinsic, contextual, representational, and accessibility. Each of these categories has specific data quality dimensions such as accuracy and completeness, associated with them. Thus, the quality of data and information can be evaluated on an individual attribute (accuracy) or a category (intrinsic). In addition, contextual data quality indicates that the quality of data and information can vary, depending on how it is used. This context for use is embodied in the Juran dimensions described earlier.

Nord, Nord and Xu (2005) examine the critical factors for DIQ in accounting information systems. The theoretical framework includes stakeholders groups including information producers, information custodians, information consumers, data/database managers and internal auditors which provide feedback regarding the dimensions of data quality performance (outcome measures) and the critical factors for DIQ in AIS. These stakeholders are similar to the roles in Wang’s (1998) information product approach.
Madnick et al. (2009) describe a framework for data and information quality research that focuses on research topics and research methods. The topic list, drawn from the scope list of the Journal of Data and Information Quality, consists of data quality impact, database related technical solutions for data quality, data quality in the context of computer science and IT and data quality in curation. Each broad category is fine-tuned with two to six sub-topics. They suggest that, because the topics continue to evolve, more detailed refinement of the topics is not necessary. Eleven research methods are suggested allowing the DIQ literature to again be classified in a two-by-two matrix, with each article categorized with one (or more) topics and one (or more) research methods.

**DIQ PMOT Research Framework**

Each of the frameworks discussed in the previous section have strengths, but none of the frameworks completely captures the complexity of the DIQ literature. Surprisingly, even though DIQ is of great importance to all organizations, no universal definition of what constitutes DIQ research exists, even though many practitioners and researchers alike are in agreement that data quality is multidimensional and often impacted by the context in which the data is used (Klein, 2000); Wang and Strong 1996; (Redman, 1998).

What makes the definition of the DIQ field difficult is that it touches the entire organization. In general, people manage operations and technologies using data and information. The DIQ literature draws upon multiple disciplines such as organizational behavior, business law, ethics, operations, and information technology, while crossing many organizational boundaries. Context, or fitness-for-use, is a critical component in determining the quality of data and information.

The development of a research framework allows for the classification of a body of literature which permits researchers in the field an understanding of what exists and what is still to be discovered. Ultimately, the generation of a list of research questions will help guide future research
efforts. A discussion of questions elicited from the research framework is found in the final section of this paper. The development of the research framework is detailed next.

A useful starting place in organizing literature is the creation of a list of attributes that should be collected. This provides us with a number of lenses through which we can view the literature. A facilitated group discussion occurred during the International Conference on Information Quality 2003 (ICIQ 2003), generating many ideas for looking at the DIQ research. Variables, with suggested values include:

- Industry affiliation—i.e. health care, government, banking, etc. (also cross industry studies)
- Functional area—i.e. marketing, logistics, etc.
- Organizational focuses—i.e. operational, tactical, strategic
- Application areas—i.e. data warehousing, inter/intranet, mailing lists, transaction processing systems, etc.
- Domain—i.e. education, government, industry, etc.
- Motivation—i.e. study DQ and IQ as the result of some occurrence, a decision that resulted in a catastrophe, to save costs, etc.
- Is the study longitudinal or a snapshot?
- Is it theoretical research or a practical application?
- Research Method—i.e. case study, experimental design, etc.
- DQ/IQ paradigms—reflection on the current models and proposal of new models; TDQM, information product, etc.
- How the DQ or IQ information will be used- i.e. support decision making, cut costs, allocate resources for data quality enhancement, etc.
- Perspective—i.e. legal, political, policy making, management, risk assessment, IQ governance etc.
- Metrics/Measurements/Standards—i.e. development of new metrics, new implementation of standard measures, benchmarking applications etc.
- DQ or IQ Value—i.e. cost/benefit, return on investment, a new metric, cost justification, etc.
In addition, as suggested by the discussion at ICIQ 2003, there are topics of interest to DIQ researchers that do not fit the above variables: best and/or worst practices; homeland security; data in voting; knowledge management; learning organizations; data quality tools, frameworks, and models; data visualization; cultural issues; metadata; career paths; DQ of software design, DQ/IQ definitions and jargon; and taxonomy of literature.

Pulling from this list, as well as the research frameworks described in the literature review section of this paper, a new framework is suggested that captures the complexity of DIQ research and allows for the formation of a set of research questions. The DIQ research framework, found in Figure 1, consists of three general areas: people, processes (management and operational) and technology (PMOT). The areas of management, operations and technology (MOT) form the three major research strands within DIQ. The role of people is applicable to each research strand, encapsulated as its own sub-category within each strand. Hereinafter, refer to the DIQ framework found in Figure 1 as PMOT. The description of the DIQ-PMOT research framework begins with people.

**People**

Within an organization, there are many stakeholders. Adapting from Wang (1998) and Nord et. al. (2005), five roles are identified: collectors, custodians, consumers, managers (data governance and IP), and auditors. Using the information lifecycle approach in Poston and Grabski (2000), we identify the various activities that each role plays. Collectors are responsible for capturing data from a primary source and data entry into a system. Custodians create structures for data storage and data views. Consumers make decisions and take action. Data governance or Information Product (IP) managers are responsible for determining what data should be captured in the first place, as well as the strategic use of data in an organization. Overall accountability for management of the information system is the responsibility of IP managers or Information Technology (IT) managers. Auditors are responsible for verifying data and information. Although it is accepted that DIQ is multi-dimensional, the auditor perspective primarily considers intrinsic data quality (accuracy,
objectivity, believability and reputation). They must also validate internal controls to ensure that systems are in compliance with regulations such as the Sarbanes-Oxley Act (SOX). If these controls are adequate, then the intrinsic quality of the data can be more readily accepted. Each of these roles can be found in the *people* section of the PMOT.

**Fitness-for-use**

Central to the framework is the context in which decisions are made and data is transformed into an information product (IP). This context will affect the perception of DIQ. Thus, *people* are linked to the fitness-for-use considerations. Adapting Juran’s questions to DIQ, the following questions are posed:

- **Who** uses the information product (IP) and who is responsible for its quality?
- **What** are the consumer’s specific determinants of an IP’s fitness-for-use?
- **How** will consumers use the IP?
- What are the *economic resources* of collectors, custodians, and consumers?
- What possibility exists for endangering *human safety*?

In addition to the above questions, the context for decision making (e.g. individual, group, organizational or global) should be considered. Both fitness-for-use and context are at the center of the framework, interacting with *people, management, operations* and *technology*.

**Processes**

Processes are comprised of *Management* and *Operations*. Drawing from Wang et. al.’s (1995) framework, the management process is decomposed into policies and procedures, legal and ethical issues, and personnel management. Operations, following the manufacturing analogy, cover the production and distribution phases and the operation and assurance services that ensure that everything is functioning correctly.
Framework for the Classification of DIQ Literature

**Figure 1.** PMOT (People, Management, Operations and Technology) Framework.
**Management**—Policies and procedures are concerned with the creation, approval and funding of corporate data and information quality policies, procedures and systems as well as upper management’s role in the DIQ system. Additionally, the policies and procedures must be implemented and processes need to be in place to ensure that they are enforced. Policies can be decision making rules as to when questionable data can be cleaned by machines and when it needs to be examined with human intervention. They could take the form of setting goals for DIQ, making a determination of “what is good enough”. The procedures would allow for implementation of the policies.

Legal and ethical focuses primarily on compliance with laws (e.g. HIPPA, Sarbanes-Oxley), regulations, and ethical codes of conduct. The processes associated with internal controls (creation and implementation) would also be found in this section. With respect to DIQ, legal and ethical issues also encompass privacy and accessibility concerns, as well as impact on human safety.

Personnel management involves making employees aware of the importance of DIQ and training them to recognize DIQ problems. It includes training employees in the policies and procedures as well as motivating them to comply with them and measuring employees’ DIQ achievements. Additionally, processes that allow for understanding the economic and non-economic costs of compliance would be in this section. The definition of new positions, such as information product manager or data quality champion, as well as the responsibilities associated with those jobs, would fall in this category.

**Operations**—DIQ production encompasses the quality requirements necessary for the procurement of raw data, including data structures and records needed for the production of IPs. This critical component of the information manufacturing system also helps ensure that the processes that transform data into information are correct, as opposed to the correctness of the data itself. The research related to data tags and data cleaning tools is included in production. Finally, the identification
of non-conforming data items and specifications of corrective action are components of the production system.

Distribution refers to the movement of data and IPs through the system. Critical components include metadata (data about the data), which allows contextual information to pass through the system along with the data. This context information can include such items as who initially created the data and the system it originated from, as well as data about the quality of the information at various locations in the system. Data integration is taking on increasing importance as corporate data warehouses and integrated websites are created to support strategic decision making. Other distribution topics include quality documentation and records management.

Operation and assurance services are provided by an independent party to validate or improve DIQ or its context. In the earlier section on people, we referred to auditors. In this section we deal with the processes that auditors would use, such as the use of Computer Assisted Audit Tools and techniques (CAATTs), embedded audit modules, and continuous auditing. In addition, this section of the framework will ask questions related to the economics of DIQ, i.e. cost benefit analysis and return on investment (ROI). Furthermore, the processes for information systems security reviews, customer satisfaction surveys and business risk assessment are included in this section.

**Technology**

The technology component of the PMOT framework explores the traditional information system components of input-process-output, as well as data governance.

**Input—** Within this area of the framework we find dimensions, measurements/metrics and fitness-for-use (DIQ in context). We look at how DIQ and fitness-for-use are defined, as well as how they are operationalized. As data is increasingly used in secondary systems such as data warehouses and web portals, the input can occur at varying times.
Input into the source system can have different quality requirements from data that is entered into the secondary resource. How does the technology support the changes that must occur in this process? Conversely, how does the fact that there are multiple input points affect the quality of the data and information? Methods for handling uncertainty with respect to such things as imprecise or fuzzy data would be included in this section.

**Process**—This section is concerned with systems and tool design. How is DIQ incorporated into the design of the system? Process is frequently the “black box” of an information system, the part that end users do not see. The information products that end users or consumers depend on for decision making must conform to the specifications that are used in that context. New protocols and standards such as XML and XBRL support data quality by tagging data for use in secondary systems. As much as possible, continuous auditing technology should be embedded in systems. Consideration of ancillary tools such as data quality and metadata tools should be a part of the design process.

**Output**—Information Products (IP) such as financial statements, budget reports, and graphical analyses become the input to the decision making process. Analysis and design of the quality aspects of the IPs will ensure that the consumer receives the correct output for the job. Quality dimensions include interpretability, ease of understanding, concise representation, and appropriate amount of data (Wang, 1996). These dimensions are dependent not only on the IP, but on the context in which it is used. Conceptual models, such as IP Maps (Shankaranarayanan, Wang, & Ziad, 2000), help to document the data flow so that the IP, within the decision maker’s context, will support operational, tactical and strategic decision making.

**Data Governance**—As data is increasingly viewed as a valuable corporate asset, the selection, preservation and management of data and information becomes more critical. New technologies such as XBRL
Framework for the Classification of DIQ Literature

(Bovee, Ettredge, Srivastava, & Vaserhelyi, 2002; Debreceny, et al., 2005; Tribunella, 2003), information security, digital optimization and messaging applications (Tribunella, Neely, & Tribunella, 2005) are paving the way to greater automation of DIQ issues. At the same time, there is an impact on internal controls when more IT functions are outsourced (Hall & Liedtka, 2007). Thus, data governance will continue to be an ever important component of the DIQ arena. Data quality audits, validation of DIQ methods and procedures, and continuous auditing techniques are part of the technology aspect of data governance. Additionally, compliance with legal and regulatory requirements should be built into the system.

**DIQ Research Topics**

In order to move the body of knowledge in a given field forward, a review of the current literature should include an analysis of what has already been done and a framework, along with research questions, for the field moving forward. The PMOT framework described in the previous section provides a foundation for the formulation of a set of research questions. These questions can be organized in more than one way. They can be organized into management, operations and technology (MOT) questions, people questions or context (fitness-for-use) questions. For the purposes of this paper, we will focus on the fitness-for-use and people components of the framework.

Ultimately, the “Who” component within fitness-for-use and the people component of PMOT have overlapping areas of concern. As can be seen in table 1, we have suggested a number of questions within the domain of Who/People. In order to cover all of the components of the framework, these questions are quite detailed, allowing researchers to focus in on multiple questions at a time. Within the Who/People context we have further divided the questions by process and technology. The focus of the current paper is development of the framework and suggestion of research questions. A list of papers in the field, along with key results can be found in Neely
and Cook (2011). In addition to the classification of papers, a discussion of future research opportunities is presented. The research determines that there are numerous opportunities for further research in the realms of Legal & Ethical, Operations & Assurance, and Personnel Management. The What and How questions have been addressed, but there are significant holes with respect to Who, Economic Resources, and Human Safety.

Sample questions for the other fitness-for-use components are provided in Tables 2–5 in Appendix A. As indicated earlier, the questions can be viewed through multiple lenses of the framework. A major contribution of this detailed list of questions is providing new researchers in the field a starting point for understanding the breadth of questions that should be

<table>
<thead>
<tr>
<th>Table 1. The Who component of fitness-for-use.</th>
<th></th>
</tr>
</thead>
</table>
| Policies & Procedures                        | Who creates regulations, policies and procedures to ensure DIQ?  
Who should be responsible for approving DIQ-related policies and procedures?  
Who should approve funding of systems and improvements to ensure DIQ?  
Who controls the budgetary resources and manages constraints associated with DIQ initiatives?  
Who should ensure policies and procedures protect people?  |
| Legal & Ethical                              | Who is responsible for compliance with laws and regulations?  
Who is responsible for auditing internal controls that concern DIQ?  
Who is responsible for ensuring DIQ practices conform to the corporation's ethical code of conduct?  
Who estimates the cost of legal and regulatory compliance?  
Who determines whether poor DIQ will harm individuals, groups, organizations or society?  |
| Personnel Management                         | Who should champion DIQ initiatives and what qualifications should they possess?  
Who should train collectors, custodians & consumers concerning DIQ policies and procedures?  
Who needs to be trained on DIQ policies and procedures?  
Who decides how money is spent to motivate and train employees?  
Who determines whether poor DIQ training will cause harm to people?  |
<table>
<thead>
<tr>
<th>Framework for the Classification of DIQ Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production</strong></td>
</tr>
<tr>
<td><em>Who</em> is responsible for production of the data (e.g., collectors, custodians, consumers)?</td>
</tr>
<tr>
<td><em>Who</em> is responsible for assigning data tags (e.g., information about the quality of the data)?</td>
</tr>
<tr>
<td><em>Who</em> determines if the process is producing correct data?</td>
</tr>
<tr>
<td><em>Who</em> funds or provides incentives for the production of quality data and IPs?</td>
</tr>
<tr>
<td><em>Who</em> monitors production processes for DIQ impact on human safety?</td>
</tr>
<tr>
<td><em>Who</em> decides what metadata is needed?</td>
</tr>
<tr>
<td><em>Who</em> is responsible for overseeing distribution?</td>
</tr>
<tr>
<td><em>Who</em> is responsible for data integration?</td>
</tr>
<tr>
<td><em>Who</em> decides whether an investment in metadata is made and if so, what tools are purchased?</td>
</tr>
<tr>
<td><em>Who</em> is responsible for ensuring that distribution of quality data and information does not negatively impact people?</td>
</tr>
<tr>
<td><em>Who</em> monitors the cost of data quality in information systems, databases, and accounting systems?</td>
</tr>
<tr>
<td><em>Who</em> defines the metrics for measuring operation and assurance costs?</td>
</tr>
<tr>
<td><em>Who</em> determines the budget for data quality enhancement?</td>
</tr>
<tr>
<td><em>Who</em> is responsible for assurance services?</td>
</tr>
<tr>
<td><em>Who</em> within the company implements recommendations provided by third parties?</td>
</tr>
<tr>
<td><strong>Distribution</strong></td>
</tr>
<tr>
<td><em>Who</em> decides what data quality dimensions and metrics are relevant?</td>
</tr>
<tr>
<td><em>Who</em> defines the operational definitions of the chosen metrics?</td>
</tr>
<tr>
<td><em>Who</em> is responsible for ensuring that data collection procedures are modified when needed?</td>
</tr>
<tr>
<td><em>Who</em> determines what the budget is for measuring data quality?</td>
</tr>
<tr>
<td><em>Who</em> decides what data quality measures are appropriate to ensure human safety?</td>
</tr>
<tr>
<td><em>Who</em> is responsible for specifying DIQ requirements during systems design?</td>
</tr>
<tr>
<td><em>Who</em> identifies emerging technologies and best practices for managing DIQ?</td>
</tr>
<tr>
<td><em>Who</em> identifies potential DIQ tool vendors and is responsible for evaluating such tools?</td>
</tr>
<tr>
<td><em>Who</em> approves the funding of DIQ systems development, including the purchase of DIQ tools?</td>
</tr>
<tr>
<td><em>Who</em> will be impacted if systems are designed without DIQ features?</td>
</tr>
</tbody>
</table>

*continued on next page*
Table 1. (continued)

<table>
<thead>
<tr>
<th>Information Products</th>
<th>Who determines the level of quality required of an IP?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Who identifies when the quality of an IP needs to be improved?</td>
</tr>
<tr>
<td></td>
<td>Who defines fitness-for-use of an IP within a decision-making context (see Figure 1)?</td>
</tr>
<tr>
<td></td>
<td>Who determines what money is available to fund improvements in the quality of IP?</td>
</tr>
<tr>
<td></td>
<td>Who is affected by the quality of IP (e.g., stockholders, employees, society)?</td>
</tr>
</tbody>
</table>

addressed, as well as the depth of individual topic areas, such as technology or fitness-for-use.

**CONCLUSIONS AND FURTHER RESEARCH**

Using the PMOT framework to guide the classification, it is our intention to flesh out the list of questions, perhaps through the lens of management, operations, and technology, in later papers. As indicated earlier, one such paper, Neely and Cook (2011), has been published and presents the results of classifying 193 DIQ papers. In addition, it is important to see how the current DIQ literature maps to these questions. It is expected that this future research will allow DIQ researchers to understand what questions have been adequately answered and what questions are under-studied. In addition, it is hoped that practitioners can use the framework as guidance in developing data quality programs within their organizations. Given the practical nature of the DIQ field, guidance in tackling the issues is seen as a very real benefit of this academic research.
REFERENCES


APPENDIX A

TABLE 2. The *What* component of fitness-for-use.

<table>
<thead>
<tr>
<th>Category</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies &amp; Procedures</td>
<td><em>What</em> are upper management’s roles and responsibilities in the creation, approval, and enforcement of DIQ-related policies, procedures and systems? <em>What</em> policies and procedures should exist specifically to deal with human safety issues such as privacy, accuracy and integrity which are important in fields like healthcare?</td>
</tr>
<tr>
<td>Legal &amp; Ethical</td>
<td><em>What</em> legal and regulatory requirements exist that pertain to DIQ (e.g., HIPPA, SOX, &amp; GLB)? <em>What</em> internal controls should exist to ensure DIQ (e.g., HIPPA, SOX, &amp; GLB)?</td>
</tr>
<tr>
<td>Personnel Management</td>
<td><em>What</em> training is necessary and why? <em>What</em> motivates employees to care about DIQ? <em>What</em> is the economic impact when personnel are improperly trained, resulting in poor DIQ?</td>
</tr>
<tr>
<td>Production</td>
<td><em>What</em> tools are available to document the processes and metrics of a distribution system (e.g., IDEF0, IQ Matrix, IASDO Model)? <em>What</em> processes and metrics are or should be a part of the distribution system? <em>What</em> metadata is needed? <em>What</em> processes exist to prevent misdirecting or distributing information to unauthorized people?</td>
</tr>
<tr>
<td>Distribution</td>
<td><em>What</em> are the economic costs associated with DIQ in an information system, database or accounting system? <em>What</em> are the metrics for measuring the operation and assurance costs? <em>What</em> are the most important security threats to DIQ? <em>What</em> is the return on investment of putting data quality systems in place?</td>
</tr>
<tr>
<td>Operations &amp; Assurance</td>
<td><em>What</em> data quality dimensions and their corresponding metrics exist or should be monitored? <em>What</em> procedures, surveys and metrics must be in place to validate and verify DIQ?</td>
</tr>
<tr>
<td>Dimensions &amp; Measurement</td>
<td><em>What</em> technologies and processes are available to manage data uncertainty (e.g., approximate, probabilistic, inexact, incomplete, imprecise, fuzzy, inaccurate data)? <em>What</em> costs (e.g., poor decision making, increased legal costs, and bad public relations) are associated with not incorporating DIQ into systems design?</td>
</tr>
</tbody>
</table>

(continued on next page)
Table 2. (continued)

| Information Products (IP) | What methods exist to measure IP quality? What are the factors that influence people's judgment about IQ (e.g., education, experience, website domain, industry, firm size, cognitive authority)? What are the costs and benefits of improving IP? What measures are used to show the impact of DIQ with respect to how IP affects human safety (e.g., percentage of loss on retirement accounts, investment decisions)? |

Table 3. The How component of fitness-for-use.

<table>
<thead>
<tr>
<th>Policies &amp; Procedures</th>
<th>How should procedures and systems be implemented and policies enforced? How should policies and procedures be documented?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal &amp; Ethical</td>
<td>How is compliance with legal requirements accomplished? How should internal controls be developed? How are ethical dilemmas handled?</td>
</tr>
<tr>
<td>Personnel Management</td>
<td>How should employees be trained concerning DIQ issues? How do you assess the effectiveness of DIQ training and incentives?</td>
</tr>
<tr>
<td>Production</td>
<td>How do you implement data integrity? How are data errors detected? How have production processes improved over time?</td>
</tr>
<tr>
<td>Distribution</td>
<td>How can data be integrated (e.g., channel integration, functional integration, data warehousing, database federation)? How should the data flowing through the system be documented?</td>
</tr>
<tr>
<td>Operations &amp; Assurance</td>
<td>How are DIQ costs gathered and measured? How are metrics operationalized? How are new technologies or models supporting operations and assurance?</td>
</tr>
<tr>
<td>Dimensions &amp; Measurement</td>
<td>How does quality differ by stakeholder? How are data quality dimensions measured and reported? How good is good enough, with respect to data quality? How does data quality vary as a function of time?</td>
</tr>
<tr>
<td>Systems &amp; Design</td>
<td>How are systems’ design processes modified to include DIQ elements? How does the system architecture affect DIQ? How does a DIQ tool facilitate cleansing?</td>
</tr>
</tbody>
</table>
**Framework for the Classification of DIQ Literature**

<table>
<thead>
<tr>
<th>Information Products (IP)</th>
<th><strong>How</strong> are semantic notations used to represent DIQ issues? <strong>How</strong> are IP metrics used to identify areas for quality improvement? <strong>How</strong> can methods used in auditing support the quality of IP?</th>
</tr>
</thead>
</table>

**TABLE 4.** The *Economic Resources* component of fitness-for-use.

<table>
<thead>
<tr>
<th>Policies &amp; Procedures</th>
<th><em>Who</em> controls the budgetary resources and manages constraints associated with DIQ initiatives? <em>What</em> are the financial, operational and legal risks associated with poor DIQ? <strong>How</strong> do economic resources factor into decision making with respect to tradeoffs in DIQ?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal &amp; Ethical</td>
<td><strong>Who</strong> estimates the cost of legal and regulatory compliance? <em>What</em> are the potential legal and economic liabilities of non-compliance? <strong>How</strong> do ethical dilemmas impact the organization economically?</td>
</tr>
<tr>
<td>Personnel Management</td>
<td><strong>Who</strong> decides how money is spent to motivate and train employees? <em>What</em> is the economic impact when personnel are improperly trained, resulting in poor DIQ? <strong>How</strong> much money should be allocated to DIQ training and the incentives budget?</td>
</tr>
<tr>
<td>Production</td>
<td><strong>Who</strong> funds or provides incentives for the production of quality data and information products? <em>What</em> are the cost categories and benefits of production, including data cleaning and integrity checks? <strong>How</strong> does one design a production process that provides data and information products that are fit for use within a fixed budget?</td>
</tr>
<tr>
<td>Distribution</td>
<td><strong>Who</strong> decides whether an investment in metadata is made and if so, what tools are purchased? <em>What</em> are the costs and benefits of distribution, including metadata collection? <strong>How</strong> can data and information be distributed to decision makers at minimal costs?</td>
</tr>
<tr>
<td>Operations &amp; Assurance</td>
<td><strong>Who</strong> is responsible for assurance services? <em>What</em> is the return on investment of putting data quality systems in place? <strong>How</strong> are costs and the decision to enhance data quality affected by economic resources?</td>
</tr>
</tbody>
</table>

(continued on next page)
**Table 4. (continued)**

<table>
<thead>
<tr>
<th>Dimensions &amp; Measurement</th>
<th>Who determines what the budget is for measuring data quality?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>What</strong> relationship exists between cost and the number of</td>
</tr>
<tr>
<td></td>
<td>dimensions measured (e.g., linear, exponential)? <strong>How</strong> does</td>
</tr>
<tr>
<td></td>
<td>the cost of data improvement affect what data is improved</td>
</tr>
<tr>
<td></td>
<td>(i.e., the cost of being accurate may be very different from</td>
</tr>
<tr>
<td></td>
<td>that associated with being timely)?</td>
</tr>
<tr>
<td>Systems &amp; Design</td>
<td><strong>Who</strong> approves the funding of DIQ systems development,</td>
</tr>
<tr>
<td></td>
<td>including the purchase of DIQ tools? <strong>What</strong> costs (e.g.,</td>
</tr>
<tr>
<td></td>
<td>poor decision making, increased legal costs, and bad public</td>
</tr>
<tr>
<td></td>
<td>relations) are associated with not incorporating DIQ into</td>
</tr>
<tr>
<td></td>
<td>systems design? <strong>How</strong> should cost/benefit analysis be</td>
</tr>
<tr>
<td></td>
<td>performed when purchasing DIQ tools or justifying DIQ</td>
</tr>
<tr>
<td></td>
<td>features within a system?</td>
</tr>
<tr>
<td>Information Products (IP)</td>
<td><strong>Who</strong> approves the funding of DIQ systems development,</td>
</tr>
<tr>
<td></td>
<td>including the purchase of DIQ tools? <strong>What</strong> are the costs</td>
</tr>
<tr>
<td></td>
<td>and benefits of improving IP? <strong>How</strong> does a decision</td>
</tr>
<tr>
<td></td>
<td>maker’s or stakeholder’s role impact the priorities of IP</td>
</tr>
<tr>
<td></td>
<td>quality improvement efforts?</td>
</tr>
</tbody>
</table>

**Table 5. The Human Safety component of fitness-for-use.**

<table>
<thead>
<tr>
<th>Policies &amp; Procedures</th>
<th><strong>Who</strong> should ensure policies and procedures protect people?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>What</strong> policies and procedures should exist specifically to</td>
</tr>
<tr>
<td></td>
<td>deal with human safety issues such as privacy, accuracy and</td>
</tr>
<tr>
<td></td>
<td>integrity which are important in fields like healthcare? <strong>How</strong></td>
</tr>
<tr>
<td></td>
<td>do these policies and procedures protect people?</td>
</tr>
<tr>
<td>Legal &amp; Ethical</td>
<td><strong>Who</strong> determines whether poor DIQ will harm individuals,</td>
</tr>
<tr>
<td></td>
<td>groups, organizations or society? <strong>What</strong> measures should</td>
</tr>
<tr>
<td></td>
<td>exist to protect people? <strong>How</strong> does non-compliance harm</td>
</tr>
<tr>
<td></td>
<td>people?</td>
</tr>
<tr>
<td>Personnel Management</td>
<td><strong>Who</strong> determines whether poor DIQ training will cause harm</td>
</tr>
<tr>
<td></td>
<td>to people? <strong>What</strong> impact does poor DIQ training have on</td>
</tr>
<tr>
<td></td>
<td>people? <strong>How</strong> should training be conducted to ensure DIQ</td>
</tr>
<tr>
<td></td>
<td>does not harm people?</td>
</tr>
<tr>
<td>Production</td>
<td><strong>Who</strong> monitors production processes for DIQ impact on</td>
</tr>
<tr>
<td></td>
<td>human safety? <strong>What</strong> is the impact on human safety if the</td>
</tr>
<tr>
<td></td>
<td>data production processes are incorrect? <strong>How</strong> are</td>
</tr>
<tr>
<td></td>
<td>production processes monitored for DIQ impact?</td>
</tr>
<tr>
<td>Framework for the Classification of DIQ Literature</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>--</td>
</tr>
<tr>
<td>Distribution</td>
<td><strong>Who</strong> is responsible for ensuring that distribution of quality data and information does not negatively impact people? <strong>What</strong> impact does a poorly designed data and information distribution system have on human safety? <strong>How</strong> can metadata improve or impact human safety?</td>
</tr>
<tr>
<td>Operations &amp; Assurance</td>
<td><strong>Who</strong> within the company implements recommendations provided by third parties? <strong>What</strong> are the operation and assurance costs associated with human safety? <strong>How</strong> do assurance services minimize the negative impact on people?</td>
</tr>
<tr>
<td>Dimensions &amp; Measurement</td>
<td><strong>Who</strong> decides what data quality measures are appropriate to ensure human safety? <strong>What</strong> are the most critical dimensions? <strong>How</strong> does the ability to effectively measure data quality affect human safety?</td>
</tr>
<tr>
<td>Systems &amp; Design</td>
<td><strong>Who</strong> will be impacted if systems are designed without DIQ features? <strong>What</strong> data privacy and protection mechanisms need to be included in systems? <strong>How</strong> does one prevent unauthorized access to the system (e.g., to prevent identity theft and financial fraud)?</td>
</tr>
<tr>
<td>Information Products (IP)</td>
<td><strong>Who</strong> is affected by the quality of IP (e.g., stockholders, employees, society)? <strong>What</strong> measures are used to show the impact of DIQ with respect to how IP affects human safety (e.g., percentage of loss on retirement accounts, investment decisions)? <strong>How</strong> does the DIQ of IP affect human safety (e.g., loss of job, retirement plan losses, and incorrect medical decisions)?</td>
</tr>
</tbody>
</table>
E-Discovery: The Intersection of Law, Technology and Business

Dr. Ian J. Redpath, Dr. Linda Volonino

It is estimated that over 95 percent of all business information is electronically stored (referred to as electronically stored information, or ESI). In the “pre-technology” environment, information was prepared on paper and stored in cabinets and boxes. These formats have been replaced with information stored on servers, laptops, flash drives, smartphones, other handheld devices, and numerous other storage media. With the United States one of the most litigious societies, the legal need to obtain ESI as either a defendant or a plaintiff is inevitable. Additionally, there may be a need to produce it by third party vendors such as Verizon, Sprint, Facebook, or Yahoo if they have ESI relevant to a case.

E-discovery (electronic discovery) is the term used to describe the legal process of discovering the ESI that is relevant to a case. The costs of ESI can run in the hundreds of thousands of dollars and there may be hundreds of thousands of documents produced with only a handful actually used in court. Businesses must know what ESI they have, where it is, and how to find it. Being unprepared for e-discovery can result in large monetary penalties or, in the extreme, losing the case. This paper addresses the common issues relevant to e-discovery and what businesses need to do to prepare in anticipation of litigation.

INTRODUCTION

Traditionally, businesses had kept their records on paper with the result being warehouses full of boxes of information. Currently approximately 95 percent of all documents generated by businesses are created electronically (Evangelista, 2004). About one-third of those electronically-created documents are never reduced to paper (Oostenrijk, 2005). This transition from paper to digital records has changed the discovery process.

Dr. Ian J. Redpath, Dr. Linda Volonino, Canisius College.
Discovery is the investigative stage of litigation during which the parties attempt to obtain evidence relevant to their cases. Today, discovery has become e-discovery. Information has become ESI. And evidence is now e-evidence (electronic evidence).

Businesses have been inundated with litigation, both civil and criminal, in which electronic information has been crucial to the outcome. There is a seemingly never ending and ever evolving burden of determining what evidence there is and where it is located. This burden generally falls on the party required to produce the evidence. Documents may be generated and/or stored in multiple locations or forms such as the hard drives of laptops, servers, and e-readers (e.g., iPad); the flash drives of smartphones and personal digital assistants (PDA); and backup tapes. The list continues to expand.

Most cases are settled during discovery without the necessity of a trial. If discovery is conducted properly, a trial attorney will be able to assess the strength and weakness of his/her case and the dangers of proceeding to trial. When all relevant evidence is known before trial, the evaluation of the merits of the case is simplified. Until 2006, the Federal Rules of Civil Procedure (FRCP, 2006) were written based on paper-based discovery. The rules did not address the discovery of electronically stored information, or ESI. In 2006, the rules were amended to specifically address ESI discovery and e-discovery was born.

The cost of finding the “digital smoking gun” can be significant. The 2007 case of Seven Network Ltd v News Ltd. can be viewed as a warning as to what can happen when e-discovery gets out of control. The Judge attempted to limit what he referred to as an “astonishing” discovery process. The matter lasted five years, with costs exceeding $200 million. Judge Ronald Sackville noted:

“The outcome of the process of discovery and production of documents in this case was an electronic database containing 85,653 documents, comprising 589,392 pages. Ultimately, 12,849 documents,
comprising 115,586 pages were admitted into evidence. The exhibit list would have been very much longer had I not rejected the tender of substantial categories of documents that the parties, particularly Seven, wished to have in evidence.” (Seven, 2007)

The Judge ultimately dismissed the claims of the plaintiff.

**FEDERAL RULES OF CIVIL PROCEDURE (FRCP)**

The Federal Rules of Civil Procedure can be looked at as the rulebook for playing the game of e-discovery. In April 2006, the United States Supreme Court approved amendments to the FRCP effective December 2006. E-discovery is now a reality that must be addressed in all litigation, big and small.

**Rule 1**

In all discovery, there is an overriding principle set forth in FRCP Rule 1. It is often overlooked because of its simplicity. However, it sets forth a clear statement of the purpose of the rules, which is: “to secure the just, speedy and inexpensive determination of every action” (FRCP 1). The general rule for discovery is that the party producing the information must bear the costs.

**Rule 26(a)**

Parties to litigation have a positive duty under FRCP Rule 26(a) to either provide a copy or a categorical description and location of any ESI that may be used to support the parties’ claims or defenses. This is a mandate without the need for a request from the other party. It reduces costs and is imposed on all parties to the litigation. The emphasis is on relevance. *Relevance* is defined by the Federal Rules of Evidence (FRE) Rule 401 as evidence having the tendency to make the existence of a fact more or less probable. In other words, that something of consequence to the case did or did not happen.
The Intersection of Law, Technology and Business

Rules 34(a) and 34(b)
Rule 34(a) of the FRCP specifically extended the scope of discovery to electronically stored information. Rule 34(a) states:

Any party may serve on any other party a request (1) to produce and permit the party making the request, or someone acting on the requestor’s behalf, to inspect, copy, test, or sample any designated documents or electronically stored information — including writings, drawings, graphs, charts, photographs, sound recordings, images, and other data or data compilations stored in any medium from which information can be obtained — translated, if necessary, by the respondent into reasonably usable form, or to inspect, copy, test, or sample any designated tangible things which constitute or contain matters within the scope of Rule 26(b) and which are in the possession, custody or control of the party upon whom the request is served.

This rule is supplemented by FRCP Rule 34(b), which allows a party to request the form in which ESI is to be produced. A party may also ‘inspect, copy, test or sample the other parties’ ESI. If you are the responding party, you may object to the requested form and tell them the form you intend to use. You must “translate” ESI into a “reasonably useable form.” If no form is requested, then the form defaults to one of the following:

- the form in which the ESI is ordinarily maintained
- a form that is reasonably useable.

Rule 26(b)
Rule 26(b) of the FRCP creates a two-tier classification to electronically stored information. Rule 26(b)(2)(B) states that:

A party need not provide discovery of electronically stored information from sources that the party identifies as not reasonably accessible because of undue burden or cost. On motion to compel discovery or for a protective order, the party from whom discovery is sought must show that the information is not reasonably
accessible because of undue burden or cost. If that showing is made, the court may nonetheless order discovery from such sources if the requesting party shows good cause, considering the limitations of Rule 26(b)(2)(C). The court may specify conditions for the discovery.

Thus, the amended FRCP creates two categories of ESI: reasonably accessible, and not reasonably accessible. However, neither the Rule nor the FRCP Advisory Committee’s Report defines these terms. The Committee only gives examples of costly or burdensome retrieval, e.g., “deleted information, information kept on some backup tape systems for disaster recovery purposes, and legacy remaining from systems no longer in use” (Beirne et al., 2006). Similar rules apply to non-parties under FRCP Rule 45.

**Zubulake v. UBS Warburg (2003)**
The Rule’s standard is “not reasonably accessible because of undue burden or cost.” This vague standard without definition requires that guidance come from judicial precedent. The seminal case on this issue is *Zubulake v. UBS Warburg* (2003). *Zubulake* was an employment discrimination case. In discovery, plaintiff requested older e-mail messages. The defendant claimed that the requested information was inaccessible, in part because of cost. In deciding this issue, Judge Scheindlin looked to the type of media on which the information is stored, and the cost of its production. Scheindlin identified five categories of ESI:

- **Active, online data:** This type of data is in an “active” stage in its life and is available for access as it is created and processed. Storage examples include hard drives or active network servers.
- **Near-line data:** This type of data is typically housed on removable media, with multiple read/write devices used to store and retrieve records. Storage examples include optical discs and magnetic tape.
- **Offline storage and archives:** This represents data on removable media that have been placed in storage. Offline storage of electronic records is traditionally used for disaster recovery or for
records considered “archival” in that their likelihood of retrieval is minimal.

- **Backup tapes:** Data stored on backup tapes isn’t organized for retrieval of individual documents or files because the organization of the data mirrors the computer’s structure, not the human records-management structure. Data stored on backup tapes is also typically compressed, allowing storage of greater volumes of data, but also making restoration more time consuming and expensive.

- **Erased, fragmented, or damaged data:** This type of data has been tagged for deletion by a computer user, but may still exist somewhere on the free space of the computer until it’s overwritten by new data. Significant efforts are required to access this data.

The first three types of ESI are considered to be *accessible*, and the last two types are considered *not reasonably accessible*. For reasonably accessible ESI, the usual rules of discovery apply, namely that the responding party pays for production. When not reasonably accessible ESI is at issue, the judge may still order that it be produced, but may shift costs to the requesting party. If the party wants it, they can pay for its discovery.

**Rule 26(b)(1) and Disclosure**

Disclosure is an on-going requirement. All pre-trial disclosures are due within 30 days of the trial date and the other party has 14 days to object. Failure to object could result in a waiver of objections for trial purposes. Generally under Rule 26(b)(1) you can discover any nonprivileged matter relevant to your claim or defense. However, if you can demonstrate that the ESI is “not reasonably accessible because of undue burden or cost” the ESI may not have to be produced or the court may shift the costs of production.

**Rule 26(f)**

FRCP Rule 26(f) is one of the most important aspects of e-discovery. At the meet-and-confer session, opposing parties are to cooperate to make
e-discovery less costly, fair and expedient. At this session or other sessions, the parties attempt to work out a plan of discovery for both what they want and how it can be produced.
E-DISCOVERY TIMELINE

In paper discovery and prior to December 1, 2006, the time frame for discovery began when the suit was filed. Not so for e-discovery. The time frame for discovery can be looked at as:

- **Time minus zero: Duty to preserve.** You need to take affirmative action--active and timely measures--to prevent the destruction or alteration of what might be relevant e-evidence. This duty generally begins when a legal action is reasonably anticipated. That’s a tough duty to comply with. Clairvoyance would be helpful since the scope of what needs to be preserved and as of when are not clear. Accept the fact that it’s difficult under the best of circumstances to know when a duty to preserve has triggered or what to preserve. Regardless, the courts consistently require counsel to be aware of these issues, and to have guided their clients appropriately in regard to the duty to preserve ESI.

- **Day 1: Complaint served.** You’re on solid ground here since there’s no mistaking that a lawsuit is in play. When the lawsuit is filed and complaint is served on the defendant, it starts a clock that counts off days, although sometimes you need to count backwards.

- **By Day 99: Meet and Confer conference.** The meet and confer conference is also a duty. Litigants must participate in a meet and confer conference to negotiate an e-discovery plan. The list of topics to negotiate include the following:
  - Any issues relating to preserving discoverable ESI.
  - Any issues relating to search, disclosure, or discovery of ESI.
  - Format in which ESI should be produced.
  - Scope of ESI holdings
  - Estimated ESI production costs in terms of difficulty, risk, time, and money.

The timeframe is established by FRCP 16(b).
Agreements made at the meet and confer and that are listed in Form 35 need to be conducted. Form 35 was amended by the new FRCP to include a report to the court about any agreements that the parties have reached.

- **By Day 120: Scheduling conference.** A scheduling conference is a hearing attended by the prosecuting attorneys, defendants, defendant’s attorneys, and the judge to schedule certain dates and deadlines for the case. This event is generally the first time the litigants and their attorneys come before the Court. (Volonino and Redpath at 19)

The rules are supplemented by other sources such as the Sedona Conference (Sedona) and Electronic Discovery Reference Model (EDRM). While not the law these are good sources in interpreting the rules. The EDRM model is:

**Duty to Preserve and Spoliation**

The duty to preserve is triggered when litigation can be “reasonably anticipated” (Zubulake and Sedona). It is therefore not triggered by the filing of a lawsuit but by anticipation that there may be litigation. Violating a duty to preserve may result in what is called an adverse inference or even a termination sanction. An adverse inference is an instruction from the judge to the jury that the failure of a party to produce certain ESI was because it would have been adverse to them. A termination sanction can result in losing the case. This would only be done in the most egregious situations.

**Preservation**

The purpose of the preservation duty is clear. Parties that anticipate litigation should not be able to purposely destroy evidence that may be unfavorable to them. This is often referred to as a *litigation hold*. Clearly the standard should not be a duty to preserve only when the case is actually
filed. It is important that a preservation letter is sent upon anticipation of litigation. This letter must indicate to all parties and non-parties that may have relevant ESI not to destroy it and to preserve it. It may be necessary that a computer be taken out of service until a forensic or preservation image can be created.

**Spoliation, Safe Harbor, and Rule 37**

Spoliation is “the destruction or significant alteration of evidence, or the failure to preserve property for another’s use as evidence in pending or reasonably foreseeable litigation,” (Watson, 2004). Spoliation can encompass four distinct torts (O’Hara and Gennaro, 2004):

1. Intentional spoliation by a party to underlying litigation
2. Negligent spoliation by a party to underlying litigation
3. Intentional spoliation by a third party not a party to underlying litigation
4. Negligent spoliation by a third party not a party to underlying litigation

Often common practices can cause spoliation, for example, deleting e-mails and documents from the system. “The fact of deletion can lead
to a court’s imposing serious sanctions for attempting to destroy relevant evidence” (Benson, 2004) if it was after the duty to preserve began. Parties can be sanctioned for spoliation under Rule 37 of the FRCP or through a court’s inherent power to oversee case management.

One problem area is the destruction of ESI through routine operation of the system of a valid document retention policy. FRCP Rule 37(e) provides a safe harbor that the court cannot impose sanctions for failing to produce ESI that you’ve lost from routine, good-faith operation of the system. Rule 37(e) provides:

Absent exceptional circumstances, a court may not impose sanctions under these rules on a party for failing to provide electronically stored information lost as a result of the routine, good-faith operation of an electronic information system.

**Good Faith**

Good faith is crucial. When litigation is anticipated, you have a duty to hold the ESI and preserve it. Steps must be taken to avoid any destruction of the ESI, even if by routine operation. If the ESI is not available, the courts look to determine whether you’ve destroyed it by routine operation. It is important that a company have a data retention policy in place under its records and information management (RIM) and also that it complies with it. The company should instruct its employees to cease any destruction of documents and take steps to assure that its system will not destroy any relevant ESI. Business must maintain a good RIM program and be able to assess what it has and where it is. A relevant document may be on a laptop of an employee or could be on a cell phone of an employee who has been terminated. That does not change the duty to find it and preserve it.

A LiveOffice survey, conducted by Osterman Research in 2007 (Osterman, 2007), polled more than 400 IT managers and users. According to the results, 63 percent of respondents had faced a legal action requiring them to produce e-mail. Fifty three percent said they weren’t prepared to meet the amended FRCP, while 30 percent weren’t even aware of the FRCP requirements.
A business needs a defensible electronic records management (ERM) as part of its overall RIM program. Records management, either paper or electronic, includes the creation, retention, continued access, and discarding and destruction of business records. The cornerstone of a defensible ESI management system and e-discovery protocol is a well-designed (reasonable, in legalese) ERM policy and program. ERM policies and programs do double-duty in terms of managing the likelihood and the impact of litigation risk. They do the following:

- Minimize or reduce risk associated with the case. You’ve heard the cliché that information is power. Against your opponent in a lawsuit, you don’t have much else. ESI is the negotiating tool or bargaining chip—a situation that moved ERM from a back-office task to a business-critical function for which IT has a major responsibility. ERM helps prevent the risk of not being able to prepare a powerful position for the meet and confer. Or not being able to show your opponent that you’re ready to respond to whatever they throw at you.
- Transfer or offset risk associated with the court. ERM helps minimize the risk associated with not being able to fulfill the duty to preserve when litigation strikes or is reasonably foreseeable. Taking early preventative measures by implementing an ERM designed with e-discovery in mind saves you legal grief down the road. Riskskyrockets for companies with sloppy prelitigation ERM practices. Having a rock solid ERM program is like insurance to offset risk. When challenged, you have the ERM defense to save your hide. (Volonino and Redpath, 2009)

In determining sanctions for spoliation, the courts will take a four-step analysis:

- Was the conduct of discovery acceptable or was it grossly negligent or willful?
- What was the interplay between the duty to preserve and the spoliation?
• Which party should bear the burden of proving that the evidence has been lost or destroyed and the consequences of that loss? and
• What is the appropriate remedy? (Pension Committee, 2010)

As noted by Judge Scheindlin in Pension Committee, it is a continuum of fault. The further along the continuum the greater the possible sanctions. Termination sanctions should be left to only the most egregious cases. The Qualcomm case (Qualcomm, 2008) is one such case. The court ordered Qualcomm to pay $8.5 million to Broadcom for legal fees incurred as a result of misconduct of Qualcomm in e-discovery.

**Rule 30(b) Witness**

In order to reduce costs and the need for multiple and probably duplicative witnesses, FRCP Rule 30(b) allows a company to designate a person to serve as a witness on ESI matters. It is imperative that this person be educated on the ESI issues so that her/she may properly be deposed on technology and practice issues. Among other things they should know:

• Which files were searched,
• How the search was conducted,
• Who conducted the search,
• What was told about the ESI being requested and
• The extent and nature of the supervision of those conducting the search.

**Protecting Privileged, Protected and Confidential ESI**

Certain types of communications/ESI do not have to be produced. The law recognizes both privilege and work product protection. The court may also protect certain confidential information such as trade secrets.

A communications privilege is meant to protect certain relationships as developed under common law. FRE 501 allows the courts to apply
common law and reason in establishing privileges. As a result, courts may differ in what they consider privileged information. Although state rules may differ from federal rules, generally, privileges apply to communications in these types of relationships:

- **Attorney–Client**: If you talk to your attorney about a legal matter, you should be able to expect that the conversation is confidential and not be used against you. If these discussions were allowed to be used in court, it would hinder the ability of attorneys to prepare cases with clients who were afraid or reluctant to be candid. The wheels of justice would get jammed.

- **Physician/Psychotherapist–Client**: Communications with a doctor that relate to diagnosis or treatment of a physical, mental, or emotional condition are covered by the privilege.

- **Husband–Wife**: Communications that were intended to be confidential and made during the marriage are considered part of the sanctity of marriage and have a privilege.

- **Religious Leader–Follower**: If you communicate in confidence to a clergyman, that communication is protected by privilege. Confidence, for this purpose, means that the communication was made privately and was not intended to be told to anyone else.

- **Accountant–Client**: Some states recognize this privilege as similar to the attorney-client privilege. However, the federal government recognizes it only in a very narrow privilege in IRS matters, a situation almost never available in third-party actions.

- **Self-Incrimination**: If a person is under a reasonable apprehension that they may be subjected to a criminal action and that what they are being asked to produce may tend to incriminate them then it need not be produced. It applies only to testimonial evidence and generally doesn’t apply to business entities to the same degree as individuals. (Volonino and Redpath at 168–169)

The United States Supreme Court in *Hickman v. Taylor* (1947), recognized that certain trial preparation materials should be protected under
the work product doctrine. These are materials that reveal your attorney’s strategy and may include evaluations of your case’s strength or weakness, reflections from interviews of witnesses, tactics, or similar information. Work product is not privileged within the meaning of the FRE, but it is safeguarded by FRCP 26(b)(3) and FRCP 45(d)(2), which grants protection to documents and tangible things that meet two criteria:

- They are prepared in anticipation of litigation or for trial.
- They are created by or for a party or its representative. (Volonino and Redpath at 169)

Work product may still be subject to e-discovery if two conditions are met:

- The material is otherwise discoverable under the FRCP or FRE.
- Your opponent shows a substantial need for the materials to prepare his case, and you cannot obtain the material by alternate means without undue hardship. This means that the information sought is essential to your opponent and crucial to the case. (Volonino and Redpath at 169)

The court with an order of protection may protect trade secrets and proprietary information. To invoke protection a business will have to show the economic loss if it is produced and that it is either not relevant or its probative value is outweighed by the potential injury if disclosed.

1. **Verify that the ESI is a trade secret or proprietary research.**
   You do this by:
   - Determining the value of the ESI both to the company and in the market (that is, internally and externally).
   - Evaluating how easy it would be for someone to duplicate your trade secret or proprietary research.
• Estimating the amount of time and effort that you spent in development.
• Identifying the level of disclosure within your business and the measures taken to protect the information.

2. **Assert that the ESI is a trade secret or proprietary research.**
   You do this by proving that:
   - The information has separate economic value.
   - You have made an effort to maintain its secrecy. (Volonino and Redpath at 170).

   This protection is not automatic and is at the discretion of the judge. The rules provide protection for ESI that is inadvertently disclosed provided the disclosing party takes appropriate steps. In fact, FRE 502 states that in a federal action, privileged or protected ESI that is inadvertently disclosed may be used for any purpose even in other actions. This same rule may not be available in a state action not covered by the Federal Rules.

**Costs Allocations Associated with e-Discovery**

The court may limit relevant information if what is requested is duplicative or the cost of production is prohibitive. As mentioned earlier, FRCP Rule 26(b) establishes a “not reasonably accessible standard”. The courts may shift the costs of production if the party still wants it. The court may also shift the cost of production as a sanction for e-discovery misconduct. The costs of production may be significant. Just some examples:

• In 2002, in *Murphy Oil v. Fluor Daniel*, Fluor Daniel spent $6.2 million to restore and print e-mail from 93 backup tapes.
• In 2002, in *Rowe Entertainment v. William Morris Agency*, the William Morris Agency spent $9.7 million to restore e-mail from 200 tapes, in addition to hundreds of thousands dollars to retrieve and review 250,000 e-mail messages.
To illustrate the cost of dealing with offline ESI, in *Bank of America Corp. v. SR Int’l Bus. Ins. Co.* (Nov. 1, 2006), the restoration and organization of e-mail data from 400 backup tapes was estimated at $1.4 million.

In *Disability Rights Council of Greater Washington v. Washington Metro Transit Authority* (June 1, 2007), the defendant failed to stop automatic purging of e-mails for three years after the complaint was filed.

It must also be remembered that the party producing may be a third party such as an e-mail provider or cell phone company.

One of the assertions that may be made to avoid production is that it would create an undue burden. Costs are often cited as being the undue burden for not reasonably accessible. This issue may also be raised as a matter of proportionality. The *proportionality issue* allows courts to limit or shift costs when the costs of discovery could exceed the possible verdict. This can help avoid the use of discovery to force settlement by making it too costly for the other side to continue the case or not settle.

The cost of discovery is usually borne by the producing party. However, Rule 26(b)(2)(C) states that:

“[T]he frequency or extent of use of the discovery methods otherwise permitted under these rules and by any local rule shall be limited by the court if it determines that: (iii) the burden or expense of the proposed discovery outweighs its likely benefit, taking into account the needs of the case, the amount in controversy, the parties’ resources, the importance of the issues at stake in the litigation, and the importance of the proposed discovery in resolving the issues.”

Courts have used this provision to order a cost shifting, or cost sharing between the parties. Allocating e-discovery costs to the parties requires a weighing and balancing of the facts to determine fairness in the production of evidence.
In *Zubulake*, the plaintiff Zubulake wanted an extensive e-discovery order to be issued for backed up email. The other side cited undue burden as a result of cost. The Court eventually ordered cost-splitting. The Court applied a seven-factor test, developed by Judge Scheindlin. Each of the factors is weighed dependent upon its importance. The seven factors are:

1. The extent to which the request is specifically tailored to discover relevant information
2. The availability of such information from other sources
3. The total cost of production, compared to the amount in controversy
4. The total cost of production, compared to the resources available to each party
5. The relative ability of each party to control cost and its incentive to do so
6. The importance of the issues at stake in the litigation
7. The relative benefits to the parties of obtaining the information

Ultimately, the plaintiff was required to bear 25% of the cost of restoring back-up tapes and the defendant the remaining 75% of the cost associated with restoration, search, and review.

**Conclusion**

It is safe to say that the FRCP places a burden on companies to be sure that their IT experts become legally savvy and their attorneys become IT savvy whenever litigation can be reasonably anticipated. As technology advances, the law must adjust to meet the new environment. The costs associated with the new world of e-discovery can be outrageously high. Often companies hire outside vendors for their e-discovery technology and legal needs because they lack the expertise or ability. This ever-changing area is a hazardous minefield for businesses that are not litigation-ready. All businesses, large and small, need to assess their exposure and develop preemptive plans to address what has become inevitable litigation. There is much to be lost unless parties are prepared for and knowledgeable in e-discovery.
REFERENCES


Federal Rules of Evidence, as in effect 2010.


Qualcomm v Broadcom, Slip Copy, 2008 WL 638108 (S.D.Cal.)


Seven Network Ltd. v News Ltd., FCA 1062 2007.

The Pension Committee of the University of Montreal Pension Plan et al. v Banc of America Securities LLC et al., No. 05 Civ. 9016 (SAS) (S.D.N.Y. Jan. 15, 2010).


The Price of Love: A Conceptual Model of Marriage and Taxes

Thomas J. Tribunella, Heidi R. Tribunella & Laurie Phelps

According to the US Census Bureau in 2007 there were approximately 112,400,000 households in America. Approximately fifty percent or 55,900,000 of those households were occupied by married couples. Approximately 62% of married families have both spouses in the workforce. Any tax policies that affect such a large percentage of the nation's households are important public policy concerns. Marriage has a significant effect on taxation. A couple may experience a marriage penalty or benefit depending upon their earnings, credits and deductions. For the purposes of this article the marriage penalty or benefit is defined as the difference in federal tax liability between what a married couple would pay and what two single persons would pay (Beach & Herderman). In this paper we present a conceptual model and detailed list of the tax code items that result in marriage penalty or benefit. We then discuss the implications of tax policies that reward some marriages while penalizing others.

Keywords: tax policy, taxation, marriage penalty.

INTRODUCTION

It has been widely reported that President Bush’s tax cut was an attempt to remove the marriage penalty from the US tax code. The idea that two people should have to pay more in taxes only because they have decided to marry seems grossly unfair and it should be removed. This certainly seemed a laudable goal since the Congressional Budget Office estimates that 43 percent of all married couples are affected by the marriage penalty (Hederman, 2000). However, a quick review of the 2010
A Model of Marriage and Taxes

tax code shows that the marriage penalty is alive and well. It is embedded throughout the code and affects high, middle and low income couples (McCaffery, 2003). We will look at the different items in the code that create marriage penalties and bonuses. We will also offer a conceptual model and a detailed list of tax items that effect the economics of marriage.

LITERATURE REVIEW AND CONTRIBUTION

Literature Review
The Nobel Laureate Gary Becker (1973) published a theory of marriage where he asserted two basic assumptions. First, each individual tries to do as well as possible by pursuing rational self interest. Second, the “marriage market” is in equilibrium in the sense that most individuals could not change mates and become better off on average. Becker then posits a number of significant implications about behavior in the marriage market. For instance, the gain to an individual from marriage compared to remaining single is positively associated with variables such as his or her income, human capital, and wage rate differential. Accordingly, the theory implies that men differing in physical capital, education, intelligence, height and other traits will tend to marry women with similar values of these traits. The motivation to marry is determined by the marginal productivities gained by each individual in the marriage contract. When both mates make gains in their well-being measured by the consumption of household-produced commodities the marriage is to their advantage. Hence, couples marry because the marriage contract creates a win-win transaction where both parties are better off after the transaction then they were before the transaction.

Potential mates do not start out with complete information about all potential mates (Becker, 1974). Therefore, the search for information is accomplished through dating, coeducational schools, “trial” marriages, and other social-economic interactions. This search is put in a life-cycle
context that includes events such as marriage, having children, sometimes divorce, remarriage, and so forth (Becker, 1974).

If one accepts the theory that marriage is a contract where the parties to the contract seek to maximize their productivity, then any affects from taxation on the contract will create incentives and disincentive to marriage. Marriage creates the formation of families and environments that are positively associated with the raising of productive, healthy and educated children (Fagan, Rector, Johnson & Peterson, 2002). For example, numerous studies have shown that children whose parents are married are significantly less likely to use drugs, have emotional problems, drop out of school, or get into trouble with the law. In addition, researchers consistently find that married adults tend to be happier, healthier and more prosperous than their unmarried peers (Brownback & Blankenhorn, 2008).

The positive effects of marriage for society are well documented (Fagan et al., 2002). Table 1 displays a comparison of various types of family units and the social-economic living conditions for the children living in those families.

Table 1 clearly displays that children are much better off when they are raised by their married biological parents. We do not intend to suggest that single individuals or married individuals without children make no contribution to society. Of course different types of people make various types of contributions. We are saying that married couples should not be singled out and economically penalized by the tax system. Furthermore, since the positive effects of marriage for society and children are well documented (Fagan et al., 2002), any disincentive to marriage created by the tax code will not serve to maximize a nation’s prosperity.

Contribution to the Literature
We contribute to the literature in several ways. First, we know of no source indicating that individuals consider US tax issues as part of their decision to get married. This type of study is conspicuously absent from the literature. Given this deficiency, we decided to provide fertile ground
<table>
<thead>
<tr>
<th>Family Description</th>
<th>Biological Marriage Intact</th>
<th>Subsequent Divorce</th>
<th>Subsequent Marriage with a Step Parent</th>
<th>Never Married Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Family Unit</td>
<td>45%</td>
<td>24%</td>
<td>25%</td>
<td>06%</td>
</tr>
<tr>
<td>Child Poverty</td>
<td>07%</td>
<td>22%</td>
<td>24%</td>
<td>51%</td>
</tr>
<tr>
<td>Family Welfare Dependence</td>
<td>12%</td>
<td>28%</td>
<td>41%</td>
<td>71%</td>
</tr>
<tr>
<td>Percent of Children Who Are “Very Happy”</td>
<td>44%</td>
<td>21%</td>
<td>44%</td>
<td>18%</td>
</tr>
<tr>
<td>Serious Child Abuse</td>
<td>01%</td>
<td>14%</td>
<td>06%</td>
<td>33%</td>
</tr>
<tr>
<td>Child Depression</td>
<td>05%</td>
<td>07%</td>
<td>07%</td>
<td>09%</td>
</tr>
<tr>
<td>School Explosion</td>
<td>01%</td>
<td>02%</td>
<td>02%</td>
<td>04%</td>
</tr>
<tr>
<td>Child Failed a Grade</td>
<td>12%</td>
<td>22%</td>
<td>22%</td>
<td>30%</td>
</tr>
<tr>
<td>Child Marijuana Use</td>
<td>20%</td>
<td>35%</td>
<td>35%</td>
<td>29%</td>
</tr>
<tr>
<td>Child Cocaine Use</td>
<td>03%</td>
<td>05%</td>
<td>05%</td>
<td>08%</td>
</tr>
<tr>
<td>Child Used Drugs While Carrying a Weapon</td>
<td>02%</td>
<td>07%</td>
<td>07%</td>
<td>07%</td>
</tr>
<tr>
<td>Child in Poor Health</td>
<td>10%</td>
<td>20%</td>
<td>12%</td>
<td>22%</td>
</tr>
<tr>
<td>Child is Sexually Active</td>
<td>32%</td>
<td>52%</td>
<td>51%</td>
<td>54%</td>
</tr>
<tr>
<td>Child Looked Favorably on Having Children Out of Wedlock</td>
<td>45%</td>
<td>58%</td>
<td>61%</td>
<td>80%</td>
</tr>
</tbody>
</table>
for future research by constructing a conceptual model. The manuscript is a thought piece that proposes a conceptual model to motivate future research into the effects of taxes on marriage. We collected no data and are making no attempt at an empirical study, but we are laying the ground work for future empirical studies.

Second, we make connections between Becker’s marriage model, tax policy, and the positive association between families and healthy children. Since couples marry because the marriage contract creates a win-win transaction, where both parties are better off after the transaction then they were before the transaction, a penalty assessed on the transaction lowers the potential advantages. This may reduce the incentive to get married, increase the incentive to divorce and/or reduce the incentive for both individuals to work since the marginal tax rate on the second income may be high. In any event, the tax code is interfering with marriage. Since the family makes positive contributions to raising children, the marriage penalty may be counterproductive.

Third, we list and model how the government interferes with the marriage contract by creating economic incentives and disincentives through the tax code. We not only draw a high level conceptual model but we specifically itemize all major elements of the tax code that effect marriage. Then we estimate the dollar impact of those items on marriage. We know of no other paper that itemizes the components of the marriage penalty in such a detailed way.

Forth, we make policy recommendations to representatives to get the government out of the marriage business to reduce any inefficiency they created through the tax code. We offer various policy changes that congress could consider.

In the final section of the paper, we suggest areas for future research to advance our knowledge of issues related to marriage and tax policies. We lay out a research agenda so future investigators can pursue the study of how tax policy effects the marriage contract. We believe that future empirical studies should test formal hypotheses. We list examples of the hypotheses that could be tested after the appropriate data is collected.
MARRIAGE PENALTY TAX ISSUES

In this section we specifically itemize all major elements of the tax code that create a marriage penalty. We also cite the IRS code sections for each item.

Tax Rate Schedules
Tax rate schedules, included in IRS code §1 are the first item that includes a marriage penalty. For taxpayers in the lower rates (10% and 15% tax brackets), no marriage penalty exists, as the tax bracket amounts for married filing jointly are exactly double the single amounts. However, the marriage penalty associated with the tax rates begins with a married couple who have $137,302 in combined taxable income equally earned by each spouse. The marriage penalty is only 6 cents; however consider a married couple a little further into the 28% tax bracket for married filing jointly. A married couple with $160,000 of taxable income, earned equally by each spouse, faces a $681 marriage penalty from tax rates alone (CCH Tax Law Editors, 2009).

Tax rate schedules can lead to a marriage bonus. A marriage bonus occurs when a married couple pays less in tax than they would if they were single (Sandorfy, 2001). This generally occurs when the spouses have a great difference in their income. The higher income spouse is allowed to average his income with the lower income from his spouse and therefore, receive the benefit of the lower tax bracket. Consider a CEO who has taxable income of $200,000 per year, whose spouse earns only $5,000 in taxable income per year. If the CEO were single he would be in the 33% tax bracket. Married to his spouse, their joint taxable income is in the 28% bracket. In 2010, the married the couple pays $45,643.50 in federal taxes. If they were single the two would pay $51,616.75. This results in a $5,973.25 marriage bonus. Just think of how big the diamond engagement ring can be!

Adjusted Gross Income (AGI) Limitations on Certain Itemized Deductions
Although we have seen a marriage bonus in the last example with married couples earning unequal amounts of taxable income; there is
also a marriage penalty that occurs for unequal amounts of income if a couple utilizes itemized deductions and those deductions are subject to AGI floors. For instance, in IRS code §213(a), medical expenses are subject to a 7.5% of AGI floor for regular tax purposes and 10% for Alternative Minimum Tax (AMT) taxpayers (per IRS code §56(b)(1)(B)). Casualty and theft losses are subject to a 10% of AGI floor per IRS code §165(c), and job expenses and certain miscellaneous deductions are subject to a 2% of AGI floor, as defined by IRS code §67(a) (Willis, Hoffman, Maloney & Raabe, 2011). Let’s suppose a husband, who has AGI of $100,000 is married to a woman whose AGI is only $20,000 and she has unreimbursed job expenses of $3,000. If she were single, her deduction related to unreimbursed job expenses would be $2,600 ($3,000 – ($20,000*2%)). Married to her husband she would only be allowed a deduction of $600 ($3,000 – ($120,000*2%)). This assumes in both cases that there are other itemized deductions that would cause the taxpayers to itemize and not take the standard deduction. Married couples in this situation may want to consider filing separately, but need to carefully consider the other tax consequences of filing separately.

For high income taxpayers, there was a limitation of certain itemized deductions included in IRS code §68 (Willis, Hoffman, Maloney & Raabe, 2010). The limitation reduces itemized deductions by the lesser of 3% of the amount of AGI that exceeds a threshold amount or 80% of the deductions subject to the limitation. The items subject to the limitation are: taxes, interest, charitable contributions and expenses subject to the 2% of AGI floor. The threshold amount is $166,800 whether you are single or married filing jointly. Since the threshold amount is the same for both filing statuses, there is a marriage penalty. The good news is that this limitation is in the process of being phased out. For the 2009 tax year only one-third of the limitation applies to tax returns. In 2010, this limitation is completely eliminated. However, it is part of the sunset provisions of the Bush tax cuts and will come back at its full amount in 2011, unless congress acts to adjust the sunset provisions. As of this writing, the debate is still on, as to whether they will let the Bush tax cuts expire.
Additional Standard Deductions and Credits for the Elderly or Disabled

The additional standard deduction included in IRS code §63(c)(1) is available for taxpayers who are over 65 or are blind. If you are blind and over 65 you are entitled to two additional standard deductions. This amount is in addition to the basic standard deduction amount and helps taxpayers who do not itemize their deductions. For single taxpayers, the amount is $1,400. However, if you have stayed married in wedded bliss for 40 years, the government reduces this amount to $1,100 (Willis, Hoffman, Maloney & Raabe, 2011). This $300 reduction can result in a marriage penalty of $30 to $105 for each additional deduction allowed due to age or blindness.

A credit is provided in IRS code §22 for elderly and disabled taxpayers that is equal to 15 percent of an initial amount and reduced by certain income. This initial amount is $5,000 for a single individual and $7,500 for a married couple who are both either elderly or disabled (Willis, Hoffman, Maloney & Raabe, 2011). This results in a maximum marriage penalty of $375.

Personal Exemption, Dependency Exemption and Child Tax Credit Phase-outs

For “high-income” earners, personal and dependency exemptions under the regular tax calculation were phased-out in 2009 in IRS code §151(d) (3). No personal and dependency exemptions are allowed for Alternative Minimum Tax (AMT) purposes, as delineated in IRS code §56(b) (1)(E). The phase-out began for single taxpayers when the taxpayer’s AGI exceeds $166,800. This phase-out could only result in a maximum reduction of $1,217 per exemption. For married taxpayers, this phase-out begins when AGI exceeds $250,200 (Willis, Hoffman, Maloney & Raabe, 2011). Therefore, married taxpayers who earned equal amounts of AGI of $125,102, would begin to lose their personal and dependency exemptions, due to the fact that they were married, but would not be close to losing them if they were single. In 2010, these phase-outs were removed.
The child tax credit, included in IRS code §24, was part of the Bush tax cut that was meant to give tax relief to families with children. This provision allows a $1,000 tax credit per child (Willis, Hoffman, Maloney & Raabe, 2011). However, this was not given to all families with children. Only certain families who do not earn over certain amounts of income are allowed to take this credit. This credit is limited for higher income taxpayers. Perhaps the most ironic part of the legislation that created this credit is that Congress built a marriage penalty into the phase-out of the child tax credit, at the same time as the Congress was trying to reduce or eliminate the marriage penalty. The phase-out begins for single taxpayers when their AGI arrives at $75,000. For no marriage penalty to exist, the phase-out should begin for married taxpayers when their AGI exceeds $150,000, but Congress set the phase-out for married taxpayers to begin when their AGI reaches $110,000. For every $1,000 that exceeds the threshold amount, $50 is taken from the child tax credit (Willis, Hoffman, Maloney & Raabe, 2011). This means that the marriage penalty could be as much as $2,000, assuming the couple has at least two children.

**Roth Individual Retirement Accounts (IRA) Phase-outs**

The Roth IRA is a popular retirement vehicle (IRS code §408A), whereby taxpayers put after-tax dollars into an IRA and the account is allowed to grow tax-free. All distributions from Roth IRAs are tax-free. However for high-income taxpayers, these are not allowed. Contributions to Roth IRAs have a phase-out range that includes a marriage penalty. For married filing jointly taxpayers, the phase-out range is from $167,000 to $177,000. For single taxpayers, the phase-out range is $105,000 to $120,000 (Willis, Hoffman, Maloney & Raabe, 2011).

**Tax Issues Related to Real Estate**

The first-time homebuyer credit was enacted during 2008 in IRS code §§36(a) and (h) and was designed to help the slumping housing market due to the financial crisis that struck the United States. As originally enacted the maximum $7,500 credit is allowed for the first time purchase of a home regardless of whether the purchaser is single or married. This credit is not
a true credit, in that it has to be repaid over 15 years, beginning two years after the home is purchased or the credit is taken. Therefore, this credit is really just an interest free loan from the federal government. For homes purchased after December 31, 2008 the credit was increased to $8,000. This credit was further expanded for homes purchased after November 6, 2009 to include taxpayers who had previously owned a home. For this new group of eligible taxpayers the maximum credit is $6,500. An $800,000 cap on the cost of the new home also applies after this date. Currently the first-time homebuyer credit may apply to purchases made by April 30, 2010 (Willis, Hoffman, Maloney & Raabe, 2010).

The marriage penalty associated with the credit occurs with the phase-out range. The beginning of the phase out range does not include a penalty, as the phase out starts at AGI of $75,000 for single and $150,000 for married filing jointly. The credit is completely phased out for married filing jointly at AGI of $170,000 and $95,000 for single. Effective for purchases beginning November 7, 2009 the phase-out limitations increase and begin at $125,000 and $225,000, completely phasing out at $145,000 and $245,000 for single and married filing joint taxpayers, respectively (Willis, Hoffman, Maloney & Raabe, 2010). For there to be no marriage penalty in these rules, the phase-out should be $190,000 (AGI limit for homes purchased prior to November 7, 2009) and $290,000 (AGI limit for homes purchased beginning November 7, 2009) for married filing joint taxpayers.

Qualified mortgage interest expense is fully deductible under IRS code §163 on acquisition indebtedness for your primary residence and your second home, provided your acquisition indebtedness is under or equal to $1 million dollars. As defined by IRS code § 163(h)(3)(B) acquisition indebtedness includes any indebtedness that is incurred in acquiring, constructing, or substantially improving any qualified residence and is secured by such residence (Willis, Hoffman, Maloney & Raabe, 2011). This $1 million dollar limitation is placed on married filing jointly taxpayers as well as single taxpayers and therefore includes a marriage penalty for taxpayers who have a large amount of acquisition indebtedness. Although this $1,000,000 limitation may only affect a minority of taxpayers of more concern is the $100,000 limitation on home equity indebtedness. Interest
on home equity loans is deductible for the regular tax (more specific limitations are applied to AMT taxpayers) on the amount of indebtedness that does not exceed $100,000 (Willis, Hoffman, Maloney & Raabe, 2011). This $100,000 is applied to single taxpayers and married filing jointly taxpayers and therefore includes a marriage penalty. Depending on the marginal tax rate the couple is in, this could be a sizable marriage penalty.

**Alternative Minimum Tax (AMT) Exemption Amounts and Phase-Outs**

The AMT (included in IRS code §§ 55-59) was enacted in 1969 to make 155 taxpayers, whose taxable income exceeded $200,000, pay taxes. They were able to avoid paying federal taxes due to legal deductions and credits. It was considered a tax on the wealthy. It is now projected that for tax years 2006 to 2009 the AMT affects 4 to 5 million taxpayers, whom might be surprised they are considered “wealthy” by the IRS (Willis, Hoffman, Maloney & Raabe, 2011). Since the Internal Revenue Code includes marriage penalties for regular tax purposes, Congress apparently decided to carry those over to the AMT calculations.

Although the AMT disallows personal and dependency exemptions, there is a sizable exemption amount (included in IRS code §55(d)) that is applied to determine the AMT taxable income. The exemption amount itself includes a marriage penalty. The AMT exemption amount for 2010 is $70,950 for married filing jointly taxpayers, while it is $46,700 for single taxpayers (Willis, Hoffman, Maloney & Raabe, 2011). This equates to a whopping $5,837 marriage penalty for those taxpayers in the 26% AMT marginal tax bracket. The exemption amounts are scheduled to decrease in the future, but usually congress acts each year to maintain or slightly increase the exemption amount.

In addition to the marriage penalty for the exemption amounts, there is a marriage penalty built into the phase out ranges (in IRS code §55(d)) if your AMT taxable income becomes too high. For married filing jointly, the phase out range for the AMT exemption begins at $150,000 and ends at $433,800. For single taxpayers that range is from $112,500 to $299,300 (Willis, Hoffman, Maloney & Raabe, 2011).
Earned Income Credit (EIC) Phase-Out

The marriage penalty is not just aimed at “wealthy” taxpayers. They have also targeted some of the lowest income earners in the country with this penalty. The earned income credit in IRS code §32 is designed to reduce some of the regressive taxes that are built into our system, such as gasoline and social security taxes. The earned income credit phase outs are tied to the number of children taxpayers have. See Table 2 for a comparison of the phase out ranges for 2009 and 2010 included in IRS code §32(a)(2)(B) regarding married and single taxpayers.

Consider two single adults with no children, each earn $7,000. If they remain single, they will avoid the phase out range. If they marry, they will end up in the phase-out range and lose part of their EIC. If they stay single, each will have an EIC of $457, a total between the two of them of $914. If they marry, and have joint earnings of $14,000, their EIC will only be $338 and the couple incurs a marriage penalty of $576 or approximately 4% of the AGI, a pretty hefty penalty for $14,000 in income.

Capital Loss Limitation

Capital losses are deductible against capital gains. If capital losses exceed capital gains, the amount of capital losses that can be used to offset ordi-

| Table 2. 2009 and 2010 Earned Income Credit Phase-out Ranges for Married and Single Taxpayers (IRS code §32(a)(2)(B))* |
|---|---|---|---|
| Single Begins | Single Ends | Married Filing Jointly Begins | Married Filing Jointly Ends |
| $7,470 | $13,440 | $12,470 | $18,440 |
| $16,420 | $35,463 | $21,420 | $40,563 |
| $16,420 | $40,295 | $21,420 | $44,295 |
| $16,420 | $43,279 | $21,420 | $48,279 |

*(Willis, Hoffman, Maloney & Raabe, 2011).
nary income is limited to $3,000 by IRS code §1211(b) regardless of whether the taxpayer is single or married filing jointly (Willis, Hoffman, Maloney & Raabe, 2011). This will result in a marriage penalty ranging from $300 to $1,050, depending on the married couples marginal tax rate. For a look at certain marriage penalty items in different income categories, refer to Table 4.

**MARRIAGE BONUS ITEMS**

In this section we specifically itemize all major elements of the tax code that create a marriage bonus. We also cite the IRS code sections for each item.

**Tax Rate Schedules**

As discussed above, a marriage bonus, in addition to a marriage penalty can occur in the tax rate schedules, which are included in IRS code §1. A marriage bonus generally occurs when the spouses have a great difference in their income. The higher income spouse is allowed to average his income with the lower income spouse and therefore receive the benefit of a lower tax bracket.

**Per Event Floor for Casualty Losses**

Casualty losses were subject to a $500 per event floor and a 10% of AGI floor, by IRS code §165(c)(3) in 2009 (Willis, Hoffman, Maloney & Raabe, 2010). In 2010, the floor returned to the 2008 amount of $100 (Willis, Hoffman, Maloney & Raabe, 2011). The $100 per event floor can result in a marriage bonus. If a married couple suffers a loss they will immediately reduce the loss by $100. If two single people are living together suffer a loss, they will have to each reduce the losses by $100. Resulting in a reduction of the loss of $200 instead of $100! So, if you are a guy, living with a girl and your apartment floods, maybe you should think about heading off to the jewelry store and the Justice of the Peace before year end, so you can file a joint return.
MARITAL NEUTRAL ITEMS

In this section we specifically itemize all major elements of the tax code that are marriage neutral. We also cite the IRS code sections for each item.

Investment Related Issues

Single initial purchasers of small business stock may deduct up to $50,000 against ordinary income, if the stock becomes worthless (IRS code §1244). This deduction amount is doubled for married filing jointly taxpayers, to $100,000 (Willis, Hoffman, Maloney & Raabe, 2011).

The deductible IRA contribution amounts (included in §§219(b)(1) and (c)(2)) are $5,000 for a single taxpayer and $10,000 for married filing jointly taxpayers, where each spouse is allowed $5,000. The catch up provision of an addition $1,000 is also a marriage neutral item (Willis, Hoffman, Maloney & Raabe, 2011).

Education Related Issues

The phase-out ranges included in IRS code §221 for student loan interest deductions are exactly double the single amounts for married filing jointly taxpayers. The phase-out range is $60,000 to $75,000 for single taxpayers and $120,000 to $150,000 for married taxpayers (Willis, Hoffman, Maloney & Raabe, 2011).

The American Opportunity and the Lifetime Learning credits, established in IRS code §25A, were enacted to assist low to middle income individuals with college costs. The American Opportunity credit is generally used for undergraduate education and the Lifetime Learning credit is generally used for graduate education. The phase-out ranges although different for the two credits, do not result in a marriage penalty. The phase-out ranges for the American Opportunity credit are $80,000 to $90,000 for single taxpayers and $160,000 to $180,000 for married filing joint credits. The phase-out ranges for the Lifetime Learning credit are $50,000 to $60,000 for single taxpayers and $100,000 to $120,000 for married filing jointly taxpayers (Willis, Hoffman, Maloney & Raabe, 2011).
Making Work Pay Credit
The making work pay credit, established in IRS code §36A, is marriage neutral. This credit was enacted to stimulate the economy. Many taxpayers receive the credit in the form of reduced withholdings in each individual paycheck. The credit is $400 and $800 for single and married filing jointly taxpayers, respectively. The phase-out ranges for this credit is $75,000 to $95,000 for single taxpayers and $150,000 to $190,000 for married filing jointly taxpayers (Willis, Hoffman, Maloney & Raabe, 2011).

Gain on Sale of a Principal Residence Exclusion
Taxpayers are allowed to exclude the gain on the sale of their principal residences from their gross incomes, subject to certain limitations. For single taxpayers, the excluded gain allowed is $250,000; for married filing jointly taxpayers, the excluded gain is $500,000, under IRS code §121(b), (Willis, Hoffman, Maloney & Raabe, 2011).

Conceptual Model of Marriage and Taxes
Now that we have discussed a number of marriage penalty, marriage bonus and marriage neutral issues, we can construct a conceptual model of the items. We used a gear-depiction in Figure 1 to display the issues in our conceptual model of marriage and taxes.

Tax laws are complex and many individuals are confused by the IRS code. The gear depiction is a visual way of conceptually understanding the tax code categories that affect marriage: negative, positive and neutral items. A gear-model was chosen for the conceptual model, as a marriage could have marriage bonus, marriage neutral and marriage penalty items included in its return. The gears are also different sizes to show the larger and smaller categories. The largest gear was selected for marriage penalty items, as by far the number of items leading to a marriage penalty are the greatest. The gear model has been augmented by Table 3 which shows the tax items by category and Table 4 which shows the potential degree in which marriage is affected by the items in each of the three categories. Below, the specific items related to marriage and taxes are summarized in Table 3.
CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

Conclusion

The number of marriage penalties included in our tax code is numerous. The marriage penalty affects all income levels of marriages, including the poor, middle income and upper income couples. See Table 4 which shows the potential degree in which marriage is affected by penalty in four income categories. The upper income marriage penalty is significant given the number of marriage penalties that are targeted at higher income taxpayers. President Bush campaigned on eliminating the marriage penalty. Although there was some marriage penalty relief in the Bush tax cuts, many marriage penalties were left in the code.

What will the future bring? Let’s take a look at the recent healthcare legislation that was recently enacted to overhaul the healthcare system within the United States. In 2013, the Patient Protection and Affordable Care Act will result in an additional 0.9 percent Medicare tax on individuals making in excess of $200,000. For married filing jointly taxpayers, the
<table>
<thead>
<tr>
<th>Bonus Items</th>
<th>Neutral Items</th>
<th>Penalty Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax rate schedules – uneven income between spouses</td>
<td>Section 1244 stock losses</td>
<td>Tax rate schedules – higher income, even income between spouses</td>
</tr>
<tr>
<td>$500 per event floor casualty losses</td>
<td>IRA contribution amounts</td>
<td>Percent AGI limitation on certain itemized deduction</td>
</tr>
<tr>
<td></td>
<td>Student loan interest deduction phase-out amounts</td>
<td>Overall limitation on itemized deductions</td>
</tr>
<tr>
<td></td>
<td>Educational credit phase-out amounts</td>
<td>Additional standard deduction</td>
</tr>
<tr>
<td></td>
<td>Making work pay credit</td>
<td>Personal and dependency exemption phase-out</td>
</tr>
<tr>
<td></td>
<td>Gain on sale of a principal residence</td>
<td>Child tax credit phase-out</td>
</tr>
<tr>
<td></td>
<td></td>
<td>First-time homebuyer credit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acquisition and home equity indebtedness limitation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alternative Minimum Tax (AMT) exemption amounts and phase-out ranges</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Earned Income Credit (EIC) phase-out</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capital loss limitation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Credit for the elderly or permanently and totally disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roth IRA phase-out ranges</td>
</tr>
</tbody>
</table>

0.9 percent tax will be on any earnings above $250,000. This results in another marriage penalty of $1,350. The assault on marriage continues!

Becker (1973) posits that marriage decisions are made in a marginal-cost and marginal-benefit framework. Therefore, you get less of what you tax (marginal-cost) and more of what you subsidize (marginal-benefit).
Penalizing marriage in favor of social welfare programs may be an inefficient use of society’s resources. This could be resulting in an unintended consequence, government policies maybe incentivizing poverty, rather than fighting a war against it.

The marriage penalty creates a disincentive to get or stay married, yet marriage contributes much to a civil society. Under the theory that you get a reduction of what you penalize (marriage and families) and more of what you subsidize (single parent households), why does the US government tax marriage? The marriage penalty is destructive to creating a civilization that produces independent, educated, law-abiding, and responsible citizens. This is a public policy issue that should not be ignored since it puts the future of our nation at risk. The marriage penalty puts financial pressure on the basic family units that are the building blocks of a stable society. Once again, we are not proposing that married couples are being purposefully targeted by congress for economic penalties. What we are asserting is that the marriage penalty is the unintended consequence of a progressive tax system (Bartlett, 1998).

In closing, our recommendation is that the government should create policies that are marriage neutral. Implementing a flat tax where deductions and credits are eliminated and the tax rate is equal at all income levels would be the best way to eliminate the marriage penalty (Mitchell, 2000). However, political circumstances and the current legislative agenda imply that fundamental tax reform is not likely in the near future. If the government wants to engage in social engineering, it should support marriage at lower income levels. In any case, there should not be a marriage penalty at any level of income since the damage to society will surely outweigh the benefits of the additional tax revenue.

Limitations of this Study
No research is perfect. Accordingly, this study has its limitations. The marriage and taxes picture could be more complete if we knew the socio-economic breakdown of what number of couples and what category of taxpayers benefit more or less from the tax code. For example, it would
<table>
<thead>
<tr>
<th>Item</th>
<th>Joint Income $14,000</th>
<th>Joint Income $75,000</th>
<th>Joint Income $150,000</th>
<th>Joint Income $250,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax Rate Schedules</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>$381</td>
<td>$2,862.50</td>
</tr>
<tr>
<td>Overall limitation on itemized deductions</td>
<td>Not Applicable in 2010 tax code</td>
<td>Not Applicable in 2010 tax code</td>
<td>Not Applicable in 2010 tax code</td>
<td>Not Applicable in 2010 tax code</td>
</tr>
<tr>
<td>Additional standard deduction</td>
<td>$30</td>
<td>$75</td>
<td>$84</td>
<td>$99</td>
</tr>
<tr>
<td>Personal &amp; Dependency exemption phase-out</td>
<td>Not Applicable in 2010 tax code</td>
<td>Not Applicable in 2010 tax code</td>
<td>Not Applicable in 2010 tax code</td>
<td>Not Applicable in 2010 tax code</td>
</tr>
<tr>
<td>Child tax credit phase-out</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>$2,000</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>1st time home buyer credit</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>(1)</td>
</tr>
<tr>
<td>Home equity indebtedness limit</td>
<td>$500 (2)</td>
<td>$1250(2)</td>
<td>$1,400(2)</td>
<td>$1650(2)</td>
</tr>
<tr>
<td>AMT Phase-out ranges</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>$9,793</td>
</tr>
<tr>
<td>EIC phase-out ranges</td>
<td>$576</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Capital loss limitation</td>
<td>$300</td>
<td>$750</td>
<td>$840</td>
<td>$990</td>
</tr>
<tr>
<td>Credit for elderly and permanently disabled</td>
<td>$375</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Roth IRA phase-out</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Notes: Not Applicable – means that the item is not applicable to the income range
(1) The marriage penalty is $8,000 if the purchase was of your 1st home, the penalty is $6,500 if it was not the purchase of your 1st home.
(2) Assumed home equity indebtedness of $100,000 per individual at a 5% interest rate.
be interesting to know what percent of tax return filers pay a marriage penalty versus the percent that benefit from a marriage bonus.

A conceptual analysis is a good starting point but the model needs to be rigorously tested. More specifically, to improve this study one could add empirical analysis. Accordingly, various statistical tests such as regression models or hypothesis testing could be performed. Some of these tests are discussed in the next section.

**Future Research**

This study motivates the further investigation of marriage and taxes. Conspicuously absent from the literature are a range of empirical analyses. One path of research could pursue an exploratory empirical analysis of the issues related to marriage and taxes. One could investigate if there is a statistically significant relationship between various tax policies and social phenomenon such as divorce. Accordingly, correlation and regression analysis could bear fruit and yield a greater understanding of the subject.

Once the exploratory investigation is completed, one could narrow the focus and test a variety of hypotheses. For example, one could test the following hypotheses:

- There is an inverse and significant association between the degree of marriage penalty in the tax code and the marriage rate.
- There is a positive and significant association between the degree of marriage penalty in the tax code and the divorce rate.

In addition, researchers could study the possibility of dynamic relationships in this area. For example, one could posit that changes in tax policies are associated with changes in economic and social behavior. A time series based research would be helpful in revealing these associations. This could provide support for cause and effect arguments. This area of research could lead to a path of discovery that would lead to a greater understanding to the behavioral effects of tax policy and marriage.
REFERENCES


A Commentary on the Relationship between the Subprime Mortgage Crisis and the Savings and Loan Debacle

Mark Mitschow & Michael Schinski

The collapse of the US subprime mortgage market has significantly damaged financial markets around the world. The size and scope of these problems make the subprime mortgage meltdown the largest financial catastrophe since the Great Depression. The subprime mortgage debacle bears many similarities to the Savings and Loan (S&L) crisis of the 1980s. In both cases regulatory and market changes combined with an abandonment of traditional lending and ethical standards to create severe economic turmoil. It is imperative that policy makers understand the causes of the current crisis if they are to implement effective reforms. One prerequisite is to recognize the similarities and differences between the US Savings & Loan Crisis in the 1980s and the most recent financial catastrophe. Toward that end this paper will proceed as follows. We will first develop a motivation for the paper and then provide background information on the two crises. We will then outline the similarities and differences (respectively) between the crises before summarizing and concluding the paper.

Keywords: Savings and Loan (S&L), subprime mortgage, derivatives, collateralized debt obligation.

The collapse of the US subprime mortgage market is causing severe repercussions for financial markets around the world. Major financial institutions such as Citigroup and Bank of America have taken hundreds of billions of dollars and losses, which in turn forced them to seek federal government assistance. Other firms such as Bear Stearns and Lehman Brothers have collapsed, and the Federal Reserve Board has been forced to take a number of difficult actions (e.g., very large interest rate cuts,

Mark Mitschow, Michael Schinski, School of Business SUNY College at Geneseo.
quantitative easing, credit guarantees) to prevent a financial panic. It is now apparent that the subprime mortgage meltdown is the largest financial catastrophe since the Great Depression.

The subprime mortgage debacle is similar in many ways to the Savings and Loan (S&L) crisis of the 1980s. In both cases significant regulatory and market changes combined with an abandonment of traditional lending and ethical standards to create a classic moral hazard problem that was not recognized before widespread financial damage ensued. Furthermore, correcting the problems has required significant regulatory changes that will materially alter the affected industries.

The unprecedented size of the subprime mortgage disaster makes it imperative that we understand both the primary causes of the current crisis and its relationship to past financial panics. Toward that end this paper will proceed as follows. Section one will outline the importance of financial service industry management and regulation to regulators, managers, and business ethicists. Section two will provide background information on the S&L and subprime mortgage crises. Section three and four will outline the similarities and differences (respectively) between the crises, while section five will summarize and conclude the manuscript.

**MOTIVATION**

Financial institutions have a fundamental instability in that their liabilities consist primarily of demand deposits which are then used to finance long term loans and investments. Periodically this has led to “bank runs” and the subsequent collapse of financial institutions (White, E.N., 2009). When this phenomenon becomes widespread it often leads to economic recessions and depressions.

Prior to the Great Depression of the 1930s bank runs were relatively frequent and resulted in sharp but short lived economic downturns. During the 19th and early 20th century major bank crises occurred at least 13 times, usually resulting in short but severe recessions. The most significant of these early runs were the Crisis of 1873 and the Panic of 1907 (White, E.N., 2009).
The Stock Market Crash of 1929 and the Great Depression in the 1930s led to an extremely severe economic contraction. From the stock market peak in August of 1929 to the trough in May, 1933, the market dropped by approximately 85% and did not return to pre-crash levels until 1954. During the Great Depression real GDP fell approximately 39% and unemployment exceeded 20%, with recovery to potential GDP only occurring in 1941 (White, E.N., 2009). As a result the federal government implemented numerous reforms, including federal insurance of deposits and significant increases in bank regulation to ensure the institutions’ safety and soundness. As a result, the frequency of bank runs declined significantly, with only two major financial crises in the post World War Two era.

Reforms implemented since the 1930s appear to have reduced the frequency of financial crashes. However, it is possible that these reforms may also increase the severity of market crashes when they do occur. One possible reason is that increased legislation and financial regulations may encourage additional risk taking. Deposit insurance and federal regulators’ too-big-to-fail policy are recognized as creating a moral hazard problem tempting bank managers to take additional risks to increase profits while the government backing keeps their cost of funds low. This movement towards taking on additional risk becomes especially problematic when new (and therefore unregulated) financial innovations impact the market. For example, the S&L crisis lasted throughout the 1980s, led to a two-year recession, and ultimately cost US taxpayers hundreds of billions of dollars to repair (Mitschow, 1994). The current financial crisis is much broader and deeper in scope, with losses already amounting into the trillions of dollars and spurring a worldwide economic recession.

One reason for this phenomenon appears to involve the dynamic nature of the financial services industry. Policy makers and regulators are often slow to respond to changing economic conditions and new financial instruments, allowing nascent problems to develop critical mass before they are addressed. The globalization of the financial services industry makes it even more difficult for policy makers to respond and increases the likelihood that future crashes and recessions will be international in nature.
Policy makers, regulators and financial industry professionals have a responsibility to protect stakeholders from catastrophic banking system failures. New regulators tools and procedures must be developed to more quickly and effectively respond to troubling financial conditions before they reach crisis proportions. The purpose of this paper is to examine the similarities and differences in the two major modern financial crises (the S&L Debacle and the current subprime crisis) so that more effective procedures can be developed to mitigate future financial crises. These crises were both quite complex and had numerous contributing causes. To highlight our points of interest we have focused this paper on a number of key factors largely related to commercial banking while limiting discussion of some others.

**BACKGROUND**

**The Savings and Loan Crisis**

The federal government has long encouraged increased home ownership. The reasons include greater neighborhood stability, increased wealth for home owners and consequent re-election of politicians. Since commercial banks were initially unwilling to provide home mortgages, the government created the savings and loan industry to fill this market niche.

Prior to the 1960s S&Ls operated in a constrained but protected market niche. S&Ls were mutually owned institutions whose loan portfolios were primarily limited to the issuance of home mortgages within a 50-mile radius of their home office (Barth, 1991). After 1966 Federal regulations permitted S&Ls to pay interest (as opposed to issuing dividends) on savings accounts at a rate ¼% to 1% higher than that offered by commercial banks (Mayer, 1990), which helped them attract funds to issue home mortgages. Furthermore, the S&L managers’ superior knowledge of the local housing market tended to discourage commercial banks from issuing home mortgages. This created such a secure economic environment that thrift managers were often known as “3-6-3 men;” they took in deposits at 3%, made home mortgage loans at 6%, and were on the golf course at 3:00p (Pizzo et al., 1989).
This comfortable economic arrangement broke down in the 1970s for several reasons. First, the Federal Reserve Board began decontrolling interest rates in the early 1970s. More significantly, the rise of inflation during this decade forced all financial institutions to increase deposit interest rates to prevent disintermediation. This was especially threatening to S&Ls because their asset base consisted almost entirely of long term, fixed rate home mortgages. The combination of short term liabilities funding very long term assets became untenable in the late 1970s. By that time thrifts were paying depositors upwards of 9% while receiving only around 6% from their assets. This meant that the S&L industry was essentially bankrupt by the end of the Carter Administration (Barth, 1991).

In the early 1980s, Congress responded by passing several pieces of legislation (most notably the Garn-St. Germain Law) designed to help thrifts out of this untenable situation primarily through deregulation. Among other things, these acts permitted S&Ls to make commercial loans, allowed real estate developers to own S&Ls, and allowed institutions to invest up to 100% of their assets with one borrower. In addition, S&Ls were subject to less stringent regulations than other financial institutions, which tended to mask the S&Ls’ underlying financial weakness (Mitschow, 1994).

The idea behind all of these reforms was to help thrifts grow out of their problems by entering into more lucrative ventures. Unfortunately, many of the old thrift managers were not prepared to handle the new, far more complex transactions, and many of the new thrift owners used “their” institutions as vehicles for self-dealing and fraud.

The situation was exacerbated by the development of brokered deposits, whereby potential depositors would use brokers to find the highest federally insured deposit interest rate available. Since brokered deposits flowed to thrifts offering the highest interest rates, thrifts could use them to rapidly grow their deposit base. However, the high cost involved forced institutions with large volumes of brokered deposits to engage in riskier lending practices (Mitschow, 1994).

To make matters worse, both thrift regulators and auditors were slow to recognize that the formerly simple S&L had become far more
complex entities. These problems were magnified as the thrift industry used its considerable influence on Capitol Hill to delay needed reforms and increased regulatory staffing. Reforms were finally initiated in the late 1980s, but by this time thrift industry insolvency had grown from approximately $1 billion in 1980 to $150 billion in 1989 (Mitschow, 1994).

**The Subprime Debacle**

During the 1990s the financial industry became increasingly internationalized and many of the 1930s regulations (e.g., Glass-Steagall) were eliminated. At the same time the federal government also began to pressure banks to increase home ownership by making loans to less credit worthy individuals. Lenders responded in part by increasing the use of securitization in order to diversify the increased risk.

Lending institutions traditionally held their loan portfolios until maturity. Due to inflationary pressures in the 1970s, however, Fannie Mae and Freddie Mac further developed procedures for banks to package their home mortgage loans into securities and sell them to investors. This securitization had a number of advantages. It allowed lenders to turn their investments into cash (and lend the money out again) far more quickly, resulting in more efficient use of capital. Securitization also eliminated the banks’ mismatch between short term liabilities and long term assets, and diversified risk. Most significantly, financial institutions began to make their money from initiating and servicing home mortgage loans rather than from holding them to maturity.

The rise of mortgage-backed securities fundamentally changed the nature of the home mortgage market. As lenders became merely “pass-through” agents and servicers, they no longer kept the loan (and its associated risk) on their books. New securities called Collateralized Mortgage Obligations (CMOs) were created to further expand the market for mortgage backed products. In CMOs, lenders sold the loans to investment banks who mixed them with other loans, sold the bundle to a trust the divided it into tranches to get a good bond rating on some of the tranches, then sold those on to their investors like pension funds or overseas banks.
As these mortgage-backed securities became more popular, there was a greater demand for new mortgage loans in order to create more securities. Thus, there was pressure on lenders to lower underwriting standards in order to make more loans. This in turn led to a dramatic increase in the riskiness of home mortgage loans being issued. From 2001–2003 almost 64% of home mortgage loans were conventional instruments that conformed to traditional underwriting standards, while fewer than 10% were subprime or Alt-A loans. By 2006, only 38.8% of loans were conventional, while 39.2% were subprime or Alt-A (Peach, 2009).

Clearly the home mortgage market had undergone significant change. Unfortunately, both policy makers and other gate keepers (e.g., credit rating agencies, appraisers) were slow to recognize this. Thanks to the growth of mortgage brokers, much of the subprime market operated outside the traditional federal regulatory environment. Mortgage brokers were subject to few federal regulations and minimal federal oversight. Instead, regulatory oversight was in essence outsourced to credit rating agencies who where largely ineffective in detecting the pending problems. The result was a dramatic increase in mortgage loans to people who could not afford them, and often involved predatory lending practices such as steering unsophisticated borrowers to more expensive subprime loans, hidden prepayment fees, or undisclosed future rate adjustments (Ashcraft, 2009). These practices ultimately fueled an unsustainable increase in home prices and construction.

Eventually the bubble burst, resulting in increased delinquencies and foreclosures, plummeting home prices and massive losses for financial institutions. The problem was exacerbated because the securitized portfolios consisted of thousands of mortgages. Since no one could tell which of the securitized tranches were bad and which were not, the result was a freeze on lending between banks and a huge increase in interest rate spreads.

Increasing use of derivatives by large banks and Wall Street firms to generate profits further fueled the subprime problem. Derivatives were initially used for hedging, but over time investors began to purchase derivative instruments for speculative purposes, and soon companies were
offering derivative insurance on increasingly complex instruments. Since the underlying asset was usually an ostensibly safe investment (i.e., home mortgages), the risk involved in these contracts was systematically underestimated both in terms of their initial pricing and any reinsurance. Furthermore, the contracts themselves became so complex most traders did not understand what they were actually trading. Consequently, when the home mortgages eventually defaulted counterparties and reinsurers such as AIG were faced with unanticipated and unsustainable losses. Due to its largely unregulated nature, no one knows the exact size of the derivative market, but it is estimated to be as much as five times the market capitalization of all publicly traded stock markets. The huge size of the derivative market meant the problem had potentially catastrophic economic impact and thus the U.S. government stepped in with an unprecedented bailout package.

The fallout from the collapse of the US home mortgage market had enormous international implications. Banks faced with massive losses and unknown future risk stopped lending, resulting in the deepest recession in a generation. As unemployment and commercial real estate loan defaults increased, governments responded by increasing spending to stimulate their economies and support unemployed workers, resulting in sharply higher deficits. Higher deficits and increased emphasis on credit risk has in turn resulted in a sovereign debt crisis in Greece, and fears of “contagion” have driven the Euro down sharply against other currencies (Blackstone, 2010; Walker & Shah, 2010)

The subprime crisis has led to a number of policy changes designed to unfreeze credit and prevent a 1930s-style depression. First, there was coordinated reduction in interest rates by central banks, with the US Federal Reserve Board (the Fed) reducing rates to 0%. The Fed also greatly increased direct lending, increasing its balance sheet from $869 billion in August 2007 to $2,268 billion in December 2008 (Hilton, 2009). The Troubled Asset Relief Program (TARP) was implemented to help financially stressed banks get rid of their “toxic assets” and the US initiated an approximately $800 billion stimulus program to help stabilize the economy.
The subprime crisis has also led to substantial changes in the lending market. Banks are once again acutely aware of credit risk, and quickly punish parties perceived as having too much credit risk. Subprime and Alt-A loans are virtually impossible to obtain, and many small businesses are having difficulty financing. Credit rating agencies are also more proactive, quickly downgrading the sovereign debt of over leveraged countries such as Spain ("Spain Debt," 2010) and Greece ("Agency Rates," 2010).

In July 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act was signed into law. The act attempts to address many of the issues that contributed to the subprime crisis. A Financial Stability Oversight Council was created and tasked to detect risks in the financial system and take prompt corrective action. The act sets up minimum standards for certain residential mortgages and mandates centralized clearing and exchange trading for many over-the-counter derivatives. Products such as credit default swaps will now come under regulatory scrutiny. Credit rating agencies will also now be subject to SEC regulation with the creation of a new Office of Credit Ratings in the agency. In dealing with the problems with securitization, the act requires that many securitizers must retain some of the risk if they issue asset-backed securities. Finally, a Bureau of Consumer Financial Protections is established that will be the primary consumer compliance regulator.

**Similarities Between the Crises**

There are several similarities between the two crises. Understanding them might help policy makers and other stakeholders avoid future financial calamities. First, both crises appeared to have their roots in a desire to increase home ownership. The S&L industry was developed specifically to increase home ownership, and the Clinton Administration explicitly pressured lenders to increase home loans to financially marginal consumers. In both cases this created market distortions that led to unintended, negative consequences.

In both the S&L and subprime events, a lack of proper regulation and oversight allowed the situations to grow to crisis proportions. In the case
of the S&Ls, the regulatory agencies generally did a poor job of ensuring that institutions were operating in a safe and appropriate manner. In the subprime market, regulators and policy makers largely ignored the activities of the generally unregulated mortgage brokerage industry. In both cases, improper lending practices and other financially unsafe activities were able to go on for years before eventually being detected. It is also interesting to note that as some concerns rose regarding possible improper behavior and abuses, the beneficiaries (S&Ls, mortgage brokers, investment banks, etc) used their political influence to prevent meaningful reforms that would have threatened short term profits.

Both crises occurred following very significant changes in the financial landscape. High interest rates and major deregulation in the 1970s and 1980s changed the way the S&L industry operated. The subprime market experienced explosive growth prior to the meltdown. The rapidly changing environment made it difficult for financial institutions to properly assess risk and for regulators to oversee the marketplace.

In both cases, policy decisions created opportunities for short-term gain by financial institutions which had negative longer-term consequences. The “packaging” of the deals and origination of loans became more important than the quality of the underlying financials. In the S&L crisis, the removal of the interest rate ceilings along with deposit insurance allowed institutions to attract large amounts of deposits and in turn fund large (potentially risky) deals with significant up front fees. In the subprime meltdown, the market was fueled by excessively low interest rates and a laissez faire attitude from government regulators. Since the lenders’ compensation was based on loans originated, not on loans repaid, underwriting standards deteriorated leading to the “any breathing borrower” rule.

Both events involved institutions chasing short term profits at the expense of prudent lending practices which led to a similar, predictable outcome. Eventually the bubble burst, creating a huge financial debacle and economic downturns that significantly hurt the economy as a whole. The similarities between the crises are outlined in Table 1 below:
TABLE 1. Similarities Between the S&L Crisis and the Subprime Mortgage Debacle.

- Both crises began with the altruistic desire to increase home ownership.
- Policy decisions created opportunities for short-term gain with longer-term consequences.
- Crises followed major changes within the marketplace.
- Lack of proper regulation and oversight allowed problems to grow.
- Political resistance stymied reform efforts.
- Financial disaster ensued once the bubble inevitably burst.

DIFFERENCES BETWEEN THE CRISSES

While questionable lending practices played an important role in both crises, the problem loans where primarily made to different sectors of the economy. Much of the S&L crisis involved problems with commercial real estate, while the current financial crisis involves primarily residential real estate. In addition, the S&L crisis affected primarily one small section of the US, with only tangential effects on the world economy. In the subprime crisis, the problem was much larger and globalization of the financial markets meant that the crisis was international in scope. The international nature of the crisis hinders a coordinated response. Given that various countries are in different economic positions (with regards to their currency, inflation, trade, employment, etc.) and have different short term goals, it is challenging to get a unified course of action.

The creation of new financial instruments led to problems in the subprime crisis that were hardly imaginable in the 1980s. The growth in the use of complex new mortgage backed securities such as CMOs meant that loan originators had little incentive to monitor borrower credit worthiness and buyers of the securities were unable to effectively determine the safety and soundness of the tranches they were holding. In addition to the new mortgage backed securities, there was a huge increase in the use of derivatives for hedging and speculation. Credit derivatives including credit default swaps became widely used by large commercial and investment banks. Inadequate pricing and regulation in the credit derivatives
market magnified the size and scope the the crisis as the subprime market collapsed. This leads to another difference between the crises.

While the S&L crisis was limited to firms within the federally regulated industry, the subprime crisis was primarily caused by non-bank financial institutions (mortgage brokers, investment banks, credit rating agencies, insurance companies, hedge funds, etc) which operated largely outside federal regulation. Thanks in large part to the development of new financial instruments as discussed above, there has been a growth in the impact that non-bank financial institutions have in the global financial system. This possess challenges to federal regulators which will be discussed in the following section. The differences between the crises are outlined in Table 2 below:

**Table 2. Differences Between the S&L Crisis and the Subprime Mortgage Debacle**

- Thrift crisis began in commercial real estate, while the subprime crisis began in residential real estate.
- The thrift crisis was limited to the US, while the subprime crisis is international.
- The subprime crisis was fueled by securities not around in the 1980s.
- Derivatives greatly exacerbated the subprime mortgage debacle.
- Unlike the S&L crisis, the subprime crisis was primarily caused by federally unregulated financial institutions.

**Summary and Conclusion**

**Summary**

Financial institutions are inherently unstable enterprises due to their use of short term liabilities to fund long term assets. Prior to the 1930s this instability resulted in regular, sharp, and short lived financial panics and recessions. Increased government regulation and other reforms appear to have made the panics less frequent, though perhaps longer in duration.

The S&L crisis of the 1980s and the current financial crisis are the most significant post-World War II financial disasters, so it is important to understand both the similarities and the differences between them. In both cases a desire to increase home ownership caused policy makers to take
actions to make it cheaper and easier to obtain a mortgage, causing the financial market to change in unanticipated ways. The gatekeepers’ (e.g., regulators, underwriters, credit rating agencies) failure to recognize significant changes and problems in the market place gave firms incentives to chase short-term profits ignoring potential long-term consequences. Political pressure was then applied by many of the parties involved to prevent necessary reforms. Eventually the bubble burst, with significant damage to the financial system and the economy as a whole.

While the two crises share many features, it is also important to note the significant differences. First, increased globalization (particularly in financial services) made the current financial crisis a worldwide rather than national crisis. This in turn makes the resulting economic damage significantly wider, deeper, and longer lasting. Second, the current financial crisis involved the development and expansion of entirely new and largely unregulated financial instruments whose effects were not fully understood. The size and ultimate impact of derivatives and securitization are still being determined, and it will take years to work out appropriate regulations. Third, reform and recovery from the current financial crisis will require unprecedented international regulatory cooperation at the very time when each country’s perspective and national interest provides incentives not to cooperate.

CONCLUSION

This paper looks at some of the similarities and differences between the Savings and Loan and Subprime crises. We chose to focus our analysis and comments more on certain aspects of the crises than others. Thus, this paper does not represent an exhaustive analysis of all factors contributing to the crises. For instance, we did not go into great depth on the role of investment banks in the subprime crisis, how liquidity linkages reached a crisis stage, or the role of the credit default swap market.

While the S&L Debacle and the subprime financial crisis are different in many ways, the comparison between them still yields some important observations for future policy makers. First, politicians should generally
resist the temptation to unbalance the playing field, even for what appear to be worthy ends. Increasing home ownership is a noble goal, and one that is difficult to oppose politically. However, establishing special rules for certain economic players creates market distortions that can have unintended consequences.

Second, both crises occurred following very significant changes in the financial landscape. The S&L crisis came following a period on historically high interest rates and significant deregulation that changed the way the industry operated. The subprime mortgage market grew from a small niche to a huge multibillion dollar market in a few short years. In both cases, in the rapidly changing environment major problems arose that resulted in a threat to the safety of the US financial system. While some of the problems stemmed from inappropriate behavior on the part of some institutions, many of the problems came from the difficulty of adjusting to and properly assessing the risk of the new financial environment. From a regulatory standpoint, this would suggest that institutions and markets need to be even more closely monitored when significant changes are occurring within the industry.

Third, it is clear following the subprime crisis that it is no longer possible to protect the safety and soundness of the US financial system by focusing solely on banks and other depository institutions. Lawmakers and regulators in the Dodd-Frank Act have attempted to extend oversight to non-bank financial institutions such as mortgage brokers, investment banks, and credit rating agencies. As with all regulation, the key is to try to strike a balance between providing safety to the system while not adding too many costs and restrictions.

Finally, increased globalization means that future business transactions will become increasingly complex and interdependent, which in turn means that future economic crises are likely to be international as well. Such downturns are also likely to be larger and more intractable, as there will be fewer healthy parties to help the economy recover. This is especially likely in the financial services industry, where major companies are already international in scope and where both money and financial services products can easily move across international boundaries.
The fungibility of financial services could easily create a “race to the bottom,” where financial services are established where regulations are weakest. Combating this will require greatly increased financial regulatory cooperation (especially among the major economic powers). Examples include uniform safety and soundness regulations, greater control on securitization and international regulation of derivatives and derivative insurance.

Financial institutions are inherently unstable enterprises where short term liabilities tend to be used to fund long term asset portfolios. Improved regulations since the Great Depression have reduced the frequency of financial crashes, but globalization is creating new challenges that the current regulatory regime is poorly structured to address. Future financial crises are likely to be international in nature, and so must the regulatory response. By examining the two largest post World War II financial crises, this paper hopefully makes a small step in that direction.
REFERENCES


Heasley, J. “Executive Summary of the Dodd-Frank Act.” *Texas Banking* (September, 2010)


**ENDNOTES**

1. “Financial institutions” include all types of depository and lending institutions, such as commercial and investment banks, savings and loans, credit unions and some types of insurance companies. We will use the term “banks” when referring to financial institutions in general. We will use the terms “savings and loans,” “S&Ls,” or “ thrifts” when referring specifically to savings and loan institutions.

2. Subprime loans are home mortgage loans that do not meet traditional underwriting standards regarding borrower down payment, income, or assets. Alt-A loans (also known as “liar loans”) are home mortgage loans were the lender does not verify the the borrower’s purported income or assets.

3. The losses could amount to $7.7 trillion dollars if home values fall 35% from their 2006 peak (White, L., 2009), which has already happened in many parts of the country.

4. A “derivative” is a financial instrument that derives its value from changes in an underlying instrument. To be classified as a derivative the instrument
must be tied to an “underlying,” have minimal up front investment relative to the possible changes, and allow for net settlement. Simple examples include options and forwards. Note that derivative investors are not required to own the underlying security.