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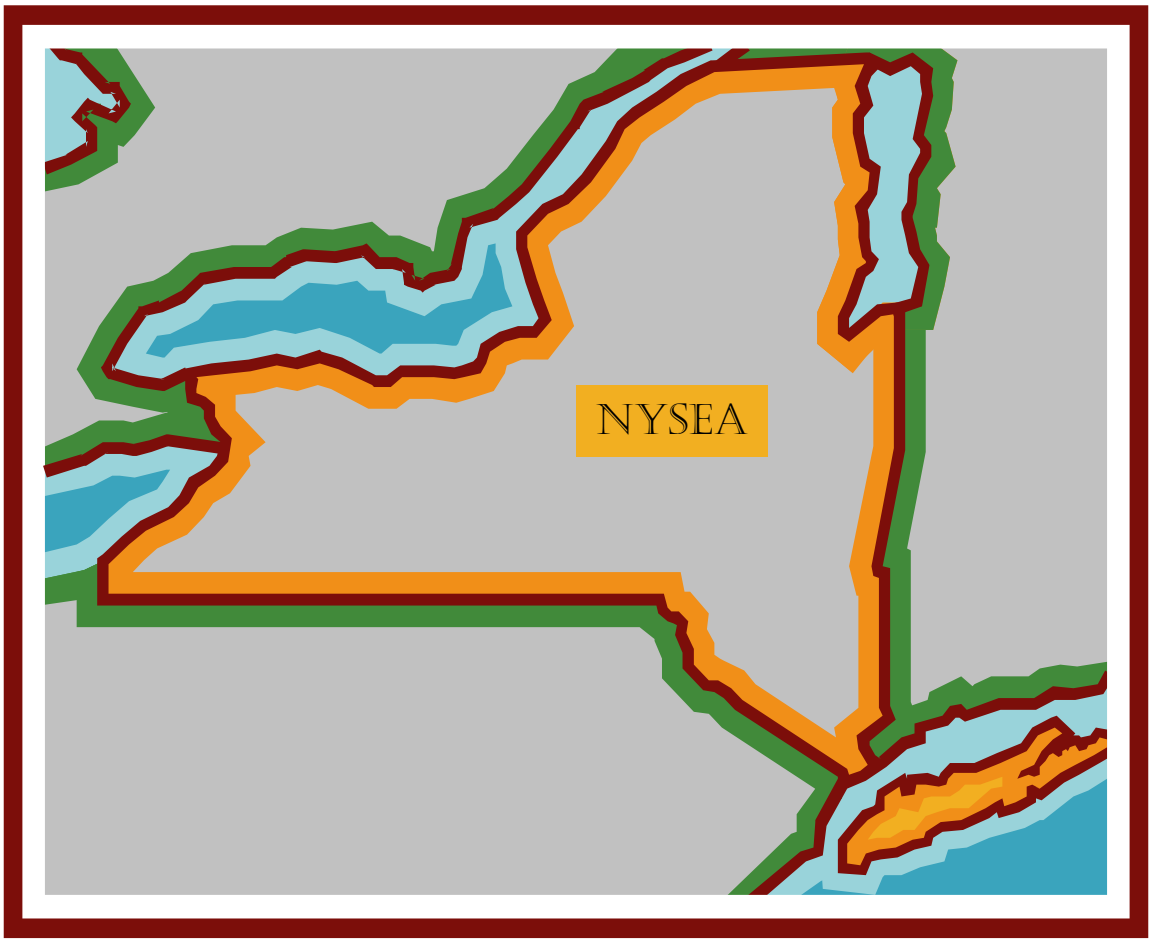

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EDITORIAL

The *New York Economic Review* is an annual journal, published in the fall. The *Review* publishes theoretical and empirical articles, and also interpretive reviews of the literature. We also encourage short articles. The *Review's* policy is to have less than a three month turnaround time for reviewing articles for publication.

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What Is a Drag on Incomes in US States: Tropicality or Lack of Civil Rights?

Paul W. Bauer*

ABSTRACT

Building on the work of Kamarck (1976) who argued "tropicality" caused countries closer to the equator to have lower incomes than those further away and Ram (1999) who tested this theory by regressing per capita personal incomes for US states on their latitudes, a proxy for tropicality, this paper has two striking findings. First, like Ram, estimating his model for every year from 1929 to 2014 finds latitude's elasticity is largest in the early years and trended down until about 1985 at which point it loses statistical significance; however, starting about 2000 it drifts up and is again statistically significant. Second, and more remarkably, for US states tropicality appears to be a misdirection. Including a dummy variable for whether a state was a member of the Confederacy during the Civil War, a proxy for a state's attitude towards civil rights, results in latitude's estimated elasticity shrinking towards zero and losing its statistical significance in every year. The estimated drag of being in the South is large and statistically significant in the early years and then diminishes over time, intriguingly roughly in line with the realization of economic opportunities and civil rights for African Americans.

BACKGROUND

Going back to at least Adam Smith's *Wealth of Nations*, economists have sought to explain income differences across regions. Smith noted geography could play a role, specifically citing the benefits of port access in the shipment of goods. More recently Kamarck (1976) offers several explanations why countries closer to the equator tend to have lower levels of per capita personal income than those further away. He points out tropical countries tend to have erratic rainfall that adversely affects agriculture and lack of frost that results in a wide variety of weeds, insects, fungi, and other microbes harming both agriculture and people.

Ram (1997) estimated the magnitude of this "tropicality" drag using data across countries and latitude as a proxy for tropicality. However, because differing data collection methods and economic and social differences could also be driving the finding of significant tropicality effects, Ram (1999) followed up by looking at the per capita personal incomes across US states. He examined multiple years, 1929, 1950, 1970, and 1990, to see if the tropicality drag changed over time, perhaps as a result of a decline in agricultural dependence, an increase in income and technology (perhaps air conditioning), or some mitigating public policies. States are an attractive alternative to countries as they have a fair amount of variation in latitude, yet the social differences

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are smaller across states than countries and they have uniform measures of per capita personal incomes over a long time period. In this study he found large and statistically significant latitude elasticities that declined from 1.6 in 1929 to 0.41 in 1990. Ram (2014) extended these results to include estimates for 2000 and 2010.

Building on Ram's work, this paper has two striking findings. First, estimates of his model for every year from 1929 to 2014 confirm the effect of latitude diminished, but only until about 1985, at which point it loses statistical significance. Starting about 2000 latitude's elasticity drifts up and is again statistically significant.

Trying to make sense of this pattern led to the second striking finding: for US states tropicality appears to be misdirection. Including a dummy variable for whether a state was a member of the Confederacy during the Civil War results in latitude's estimated elasticity shrinking towards zero and losing its statistical significance in every year. In contrast, the estimated drag of being in the South is large and statistically significant in the early years and then diminishes over time. This finding holds up even when more direct measures of tropicality (average precipitation and average heating and cooling degree days) are added to the model, suggesting that for US states the drag is not tropicality but something related to being in the South.

Tropicality may have played a role in determining where slavery would take root because it determines where plantation crops such as tobacco and cotton can be grown, but it appears the legacy of slavery is the drag on state incomes. Slavery and its legacy is a major difference between these southern states and the rest of the country. African Americans' economic opportunities and civil rights were denied not only under slavery, but effectively for decades afterwards by "Jim Crow" laws. Consequently, membership in the Confederacy is a good proxy for a state's attitude towards civil rights.

Restricted educational opportunities for African Americans is only one form the resulting discrimination took, leading to lower educational attainments for African Americans and consequently these states as a whole. Glaeser and Saiz (2004), Mankiw, Romer, and Weil (1992), Florida (2002), and Bauer, Schweitzer, and Shane (2012) all show higher educational attainment leads to higher per capita personal incomes.

There appears to be three distinct periods. The effect of being in the South diminishes sharply from 1929 to 1945, is roughly constant from 1945 to 1960, and then fairly steadily declines until it becomes statistically insignificant in 1991. By 2014 the point estimate is down to just -8.9 percent with a standard error of 8.5 percent. Although more investigation is needed, the time pattern is consistent with a role for the acquisition of economic opportunities and civil rights by African Americans.

The following section discusses Ram's model and this paper's extensions. The required data are described in the following section and is followed by an exploration of the estimation results. The last section concludes.

MODEL

Ram (1999) estimated the following model of a state's per capital personal income separately for 1929, 1950, 1970, and 1990,

(1) $\ln(PCPI_i) = \beta_0 + \beta_L \ln(Latitude_i) + u_i$,

where PCPI is the per capita personal income of a state, Latitude is the average latitude of a state, and u_i represents other factors influencing a state's per capita personal income. Given the log-log functional form, β_L is the elasticity of PCPI with respect to latitude. Given Kamarck's (1976) tropicality theory, the sign is expected to be positive, the further a state is from the equator the higher its per capita personal income.

Ram argues this simple model is worth considering for three main reasons. First, Ram notes that tropicality has an influence on many variables including labor, capital, and schooling that affect income. Consequently, including these variables would understate tropicality's full effect on income because of "over controlling". Second, latitude is certainly a strictly exogenous variable, whereas these other factors are likely endogenous—at least if current values are included. Finally, a White (1980) test fails to reject its joint null hypothesis of no heteroskedasticity and no-specification error.

This paper extends Ram's analysis by estimating his model separately for every year from 1929 to 2014. This is the most flexible way to model the relationship, allowing the intercept and slope coefficients to vary by year. To test whether latitude or something about being in the South is driving the differences in per capita personal incomes, the following model is estimated for each year,

(2) $\ln(PCPI_i) = \beta_0 + \beta_L \ln(Latitude_i) + \beta_s South_i + u_i$,

where $South_i$ is an indicator variable equal to one if the state was in the Confederacy during the Civil War and zero otherwise.

Finally, to test the robustness of the finding that South has more explanatory power than latitude, climate variables that directly measure the characteristics Kamarck had in mind are included in the model,

(3) $\ln(PCPI_i) = \beta_0 + \beta_L \ln(Latitude_i) + \beta_S I(South_i) + \beta_R \ln(Rain_i) + \beta_H \ln(Heat_i) + \beta_C \ln(Cool_i) + u_t$,

where Rain is a state's average rainfall, Heat is a state's average heating-degree days, and Cool is a state's average cooling-degree days.

Given the large number of coefficients estimated in these models, for example, even model (1), the most parsimonious model, has 86 year specific intercepts and slope estimates, it is more informative to look at a plot of the estimated elasticities and their 95 percent confidence intervals over time than a table of the same numbers.[1]

DATA

Annual data from 1929 to 2014 on per capita personal income for the 48 contiguous states were obtained from the Bureau of Economic Analysis. Latitude data comes from the Maxmind Developer. Climate is measured by annual heating-degree days, cooling-degree days, and inches of precipitation, using data available from the National Oceanic and Atmospheric Administration (NOAA). In calculating heating and cooling degree days, NOAA assumes when the outside temperature is 65°F, people do not need heating or cooling to be comfortable. Degree days are the difference between a day's average daily temperature and 65°F. Temperatures above 65°F result in cooling-degree days, and temperatures below 65°F result in heating-degree days. Because the climate variables are the annual averages over 1929 to 2003, they are constant over time.

Summary statistics for the variables are presented in Table 1. Measured in 2014 dollars, the average real per capita personal income (PCPI) across states increased by a factor of five from 1929 to 2014. Also note that there has been substantial PCPI convergence across states over this period. The coefficient of variation (the standard deviation divided by the mean) of PCPI fell from 0.366 to 0.155. Another measure of dispersion, the ratio of the maximum to minimum state PCPI, fell from 4.33 to 1.88. As Barro and Sala-i-Martin (1992) found, consistent with neoclassical growth theory, US states are converging but at a fairly slow rate.

The eleven former Confederate states in order of succession are South Carolina, Mississippi, Florida, Alabama, Georgia, Louisiana, Texas, Virginia, Arkansas, Tennessee, and North Carolina. They comprise 22.9 percent of the total 48 coterminous states. In 1929, these states' PCPI averaged $5,093 compared to non-South states' $9,494. By 2014, states in the South managed to narrow the gap, with their PCPI averaging $40,526 versus $46,171 for the rest of the contiguous states.

The other regressors vary substantially across states. State latitudes average 39.4 degrees North but range by almost a factor of two from 27.8 to 47.5. The variation of the climate variables is even more substantial. The ratio of the maximum to minimum Cooling- and Heating-degree days is over 18 and 13, respectively. The ratio for precipitation is about 6.5.

Table 1 Summary Statistic

Variable	Mean	Std. Dev.	Minimum	Maximum
Real PCPI (1929) [2]	8,484	3,104	3,695	15,999
Real PCPI (2014)	44,877	6,935	34,431	64,864
Latitude	39.4	4.7	27.8	47.5
South	0.229	0.425	0.0	1.0
Cooling-degree days	1071.2	764.2	184.0	3356.0
Heating-degree days	5401.5	2090.9	713.0	9601.0
Precipitation	35.6	13.8	8.9	57.8

Understanding the underlying correlations will help interpret the subsequent regression results. Table 2 shows that latitude and the climate variables are closely related. As one would expect, latitude and cooling-degree days are highly negatively correlated while latitude and heating-degree days are highly positively correlated. Being a state in the South is less correlated with latitude but still fairly high. Other things being equal, these high correlations will inflate a regression coefficient's standard errors, making statistical significance harder to obtain.

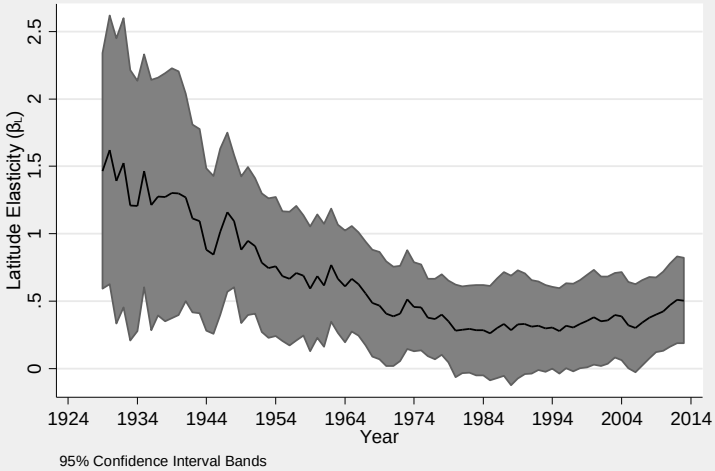
Table 2. Correlations

	ln(Latitude)	ln(Cool)	ln(Heat)	ln(Rain)	South
ln(Latitude)	1.000				
ln(Cool)	-0.906	1.000			
ln(Heat)	0.917	-0.863	1.000		
ln(Rain)	-0.398	0.300	-0.440	1.000	
ln(South)	-0.736	0.675	-0.686	0.557	1.000

RESULTS

First, consider the results from estimating model (1), Ram's (1999) model (see Figure 1). Qualitatively they are the same as his but differ slightly numerically for three reasons. First, and likely the main reason, he treats the District of Columbia as a state, whereas it is not included in this analysis as it is more of a city than a state. Next, a different source for states' average latitude was employed in this analysis. Finally, the BLS has made some minor revisions to the PCPI data since he collected his data.[3]

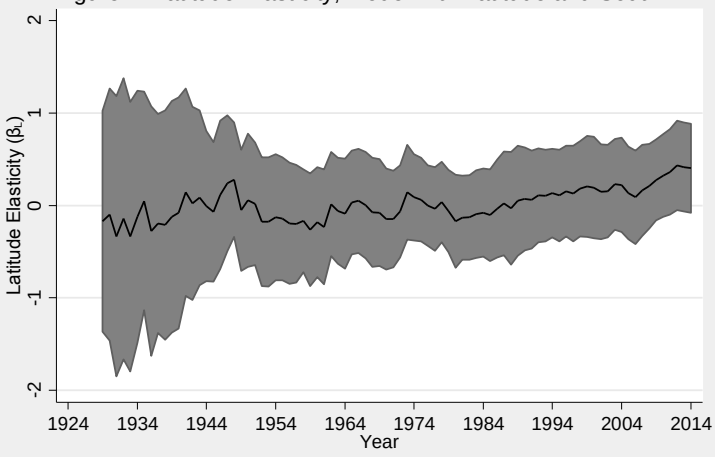
Figure 1: Latitude Elasticity, Updated Ram(1999) Model



Like Ram, a relatively large elasticity is found for latitude in 1929 (1.5 versus his 1.6) and the estimated elasticities also decline over time. By 1985 it has fallen to 0.26 and is no longer statistically significant. However, starting in 2000, latitude's estimated elasticity drifts up and by the early 2000s is again statistically significant. In 2014, the estimated elasticity is back up to 0.504 with a p-value of 0.003.

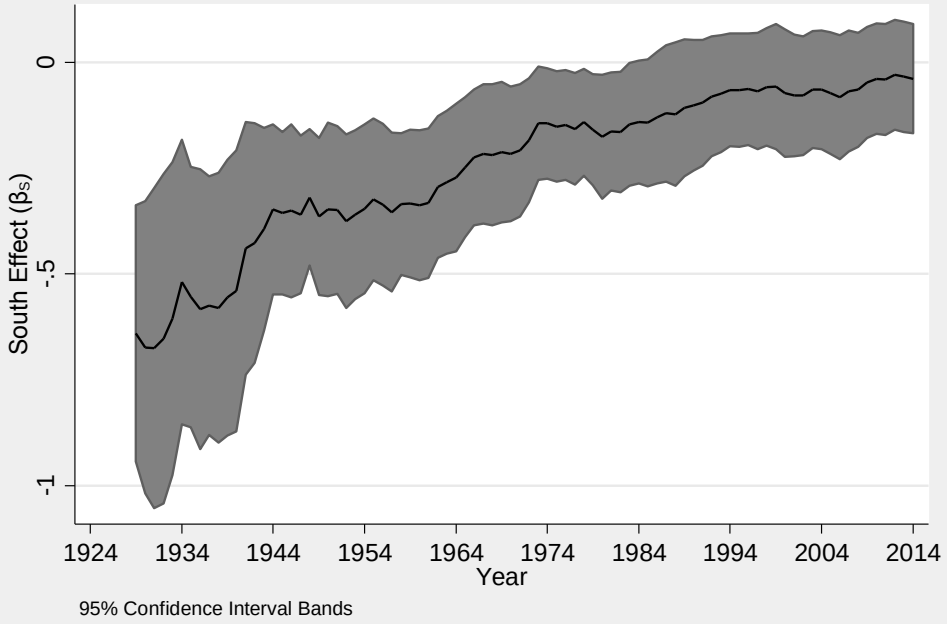
This rise is unexpected. It would be easy to understand how the widespread adoption of affordable air conditioning and pesticides could lessen the tropicality drag, but the recent increase is a puzzle. In casting around for possible explanations, the regional patterns of state PCPI suggested including a dummy variable for the South. The estimated latitude elasticities from model (2) are graphed in Figure 2. In every year, latitude's estimated elasticity moved towards zero and loses its statistical significance.[4]

Figure 2: Latitude Elasticity, Model with Latitude and South



In contrast, the estimated coefficients on the South dummy variable are statistically significant up to 1982 (see Figure 3). Being in the South is a large drag early in the sample, -0.64 in 1929, but this drag diminishes over time. Beginning in 1983, the South effect is no longer statistically significant, although the point estimate of the drag is still sizable at -14.7 percent. By 2014 the point estimate is down to just -3.9 percent with a standard error of 6.6 percent.

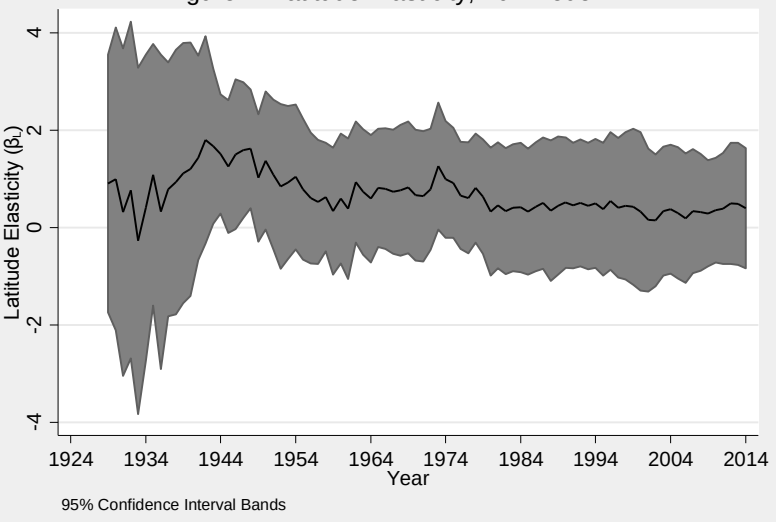
Figure 3: South Effect, Model with Latitude and South



These results are consistent with what Acemoglu et al. (2001) found looking at countries. Countries in Africa or those closer to the equator do not have lower incomes once the effect of institutions is controlled for. Further, they find evidence that income and growth depend on a cluster of institutions, such as constraints on government expropriation, independent judiciary, property rights enforcement, and institutions providing equal access to education and ensuring civil liberties.

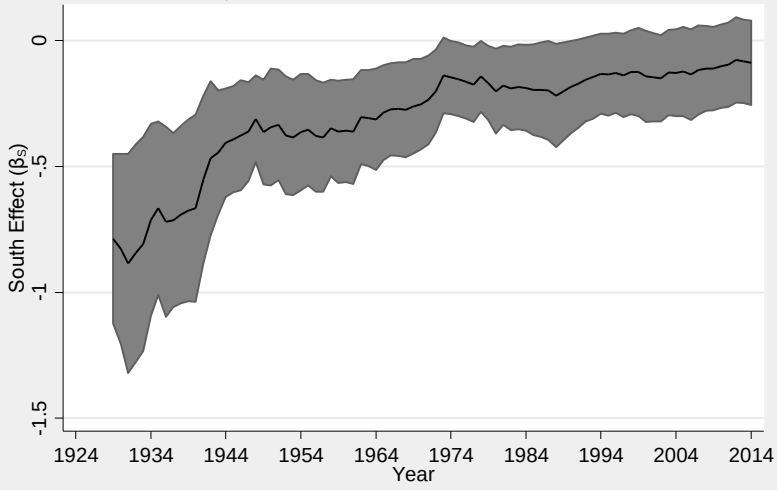
Still, it could be the case that the South dummy is picking up elements of tropicality not captured by latitude. To test this conjecture, model (3) includes direct measures of tropicality: average precipitation and heating and cooling degree days. Although the magnitude of latitude's estimated elasticity increases, it remains statistically insignificant in nearly every year (see Figure 4).

Figure 4: Latitude Elasticity, Full Model



Even with the inclusion of the climate variables, the effect of being in the South remains quantitatively and statistically similar to model (3) (see Figure 5). Considering these estimates more closely, there appear to be three distinct periods. The first, from 1929 to roughly 1945, is a period of rapid convergence for states in the South. More work is needed but African American migration, New Deal programs, and mobilization for World War II are the most likely causes for convergence during this period.

Figure 5: South Effect, Full Model



In the second period, from roughly 1945 to 1960, the drag of being in the South is relatively constant with a coefficient of about -0.35. In the last period, beginning in about 1960 and continuing on to the present, there is relatively steady convergence to the rest of the nation. Since 1991, this effect is no longer been statistically significant. In 2014 the point estimate is in this model is -0.089 with a standard error of 0.085.

More research is needed to explain this pattern over time, but the South variable is a proxy for a state's attitude towards civil rights. As such, the falling South coefficient in the latter period is consistent with the rise of civil rights for African Americans in this region. As mentioned earlier, better education is a well-studied channel through which better civil rights could lead to a diminishing of the South effect. After Brown v. Board of Education in 1954, African Americans have received better educations leading to better earnings prospects and consequently improved their states' per capita personal incomes. The benefits of better education would accrue with a lag, and so would be consistent with the observed improvement in the early 1960s.

Also consistent with the observed time pattern would be the beneficial effects of the Civil Rights Acts of 1957, 1960, and 1964, which respectively worked to ensure that all Americans could exercise their right to vote, established federal inspection of local voter registration polls and introduced penalties for anyone who obstructed someone's attempt to register to vote, and outlawed discrimination based on race, color, religion, sex, or national origin.

SUMMARY

This paper extends the work of Ram (1999) through 2014, includes direct measures of tropicality, and finds a alternative explanation with stronger empirical support for the variation in per capita personal incomes across US states. Instead of tropicality, this paper employs the novel approach of including a dummy variable for whether a state was a member of the Confederacy during the Civil War, a proxy for a state's attitude towards civil rights. Although the effect of being in the South is substantial in 1929, the effect diminishes sharply from 1929 to 1945. It is roughly constant from over 1945 to 1960 before it declines fairly steadily until it becomes statistically insignificant in 1991. By 2014 the point estimate is down to just -8.9 percent with a standard error of 8.5 percent.

More work needs to be done to explore the causes of this pattern over time, but it appears likely to be initially a combination of New Deal policies, African American migration out of the South, and the location of WWII factories across the country. However, these factors likely were played out by 1945. The South effect did not diminish significantly again until the early 1960s, suggesting that the subsequent improvement could be the result of improved economic opportunities and civil rights for African Americans, particularly better educational opportunities after Brown v. Board of Education.

ACKNOWLEDGMENTS

I wish to thank my SUNY Oneonta colleagues, an anonymous referee, and the editor for many helpful suggestions and comments.

ENDNOTES

[1] Full results for all of the estimated models are available by request from the author.

[2] Figures are in 2014 dollars.

[3] See the Appendix for a detailed comparison of my estimates versus Ram's for 1929, 1950, 1970, and 1990.

[4] Further empirical support for focusing on the South dummy variable instead of Latitude is that both the Akaike and Bayes Information Criterion (two widely used goodness of fit measures) are substantially better in a regression of the natural log PCPI on the former than the latter (AIC -2321.2 versus -1427.9 and the BIC -1233.2 versus -339.9, respectively).

REFERENCES

Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review*, 91(5): 1369-1401.

Barro, Robert J. and Xavier Sala-i-Martin. 1992. “Convergence.” *Journal of Political Economy*, 100(2): 223-251.

Bauer, Paul W., Mark E. Schweitzer, and Scott A. Shane. 2012. “Knowledge Matters: The Long-Run Determinants of State Income Growth.” *Journal of Regional Science,* 52(2): 240-255.

Florida, Richard. 2002. “Bohemia and Economic Geography.” *Journal of Economic Geography*, 2(1): 55-71

Glaeser, Edward L. and Albert Saiz. 2004. “The Rise of the Skilled City.” *Brookings-Wharton Papers on Urban Affairs:*. 47-105.

Kamarck, Andrew M., *Tropics and Economic Development,* John Hopkins University Press, Baltimore, MD, 1976.

Mankiw, N. Gregory, David Romer, and David N. Weil. 1992. “A Contribution to the Empirics of Economic Growth.” NBER Working Paper Series #3541.Ram, Rati (1997) “Tropics and Economic Development: An Empirical Investigation,” *World Development*, 25: 1443-1452.

Maxmind, Average Latitude and Longitude for US States, http://dev.maxmind.com/geoip/legacy/codes/state_latlon/

Ram, Rati. 1997. “Tropics and Economic Development: An Empirical Investigation.” *World Development*, 25: 1443-1452.

Ram, Rati. 1999. “Tropics and Income: A Longitudinal Study of the U.S. States.” *Review of Income and Wealth*, 45(3): 373-378.

Ram, Rati. 2014. “Tropics and Income in the U.S. States: Further Evidence from Recent Data.” *Atlantic Economic Journal*, 43(1): 163-164.

White, H. 1980. “A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity.” *Econometrics*, 48: 817-38.

APPENDIX

These results differ slightly from Ram (1999) for three reasons. First, he used the 48 contiguous states and the District of Columbia, while this paper only employs the former, so there is one fewer cross sectional observation in each year. In addition, there have been minor revisions in the personal income data over the years. Lastly, this paper employs Maxmind data for latitude rather than Goode's World Atlas. Nonetheless, as Table A1 shows, both sets of results are qualitatively similar in that latitude's effect is statistically significant but diminishing over time. The only material difference is that now the 1990 latitude elasticity just fails statistical significance at the 5 percent level. Note the standard errors are calculated under different assumptions. Ram assumed homoskedasticity, whereas this paper allows for heteroskedasticity.

Table A1

	Ram (1999)		**Bauer (2016)**	
Year	**Coefficient**	**t-statistic**	**Coefficient**	**t-statistic**
1929	1.599	3.93	1.466	3.99
1950	1.044	4.21	0.947	3.82
1970	0.500	2.68	0.407	2.33
1990	0.408	2.15	0.331	1.90

Does the Unit of Analysis for Poverty Measurement Matter? A Comparison of the Supplemental Poverty Measure and the Official Poverty Measure

Ashley Provencher, Ph. D.*

ABSTRACT

In 2010, the Interagency Technical Working Group issued a series of suggestions on how to develop a Supplemental Poverty Measure. One suggestion was that the family unit should be broadened to include all related individuals, any co-resident unrelated children, plus cohabiting partners and their children. Using data from the 2010 Current Population Survey Annual Social and Economic Supplement, this paper examines how the change in unit of analysis from the family definition used in the official poverty measure to the broader definition affects the composition of family units. Implications for poverty estimates are discussed.

1. INTRODUCTION

Each year the U.S. Census Bureau estimates the official poverty rate for the United States following specific guidelines on how to group people within households into family units, which types of monetary supports comprise family income, and the thresholds of income needed for each family type to be out of poverty. The official methodology has changed very little since the 1960s while the dynamic of families has evolved. Single-parent families, multigenerational families, cohabitating partners, and foster children are more prevalent today than in recent decades (Kennedy and Bumpass, 2008; Seltzer, Lau, and Bianchi, 2012). The unit of analysis, also referred to as the resource unit, should therefore reflect this demographic evolution in order to more precisely identify those families with low economic well-being. In 2011, the U.S. Census attempted to do just this by producing the supplemental poverty measure (SPM).

The SPM is an experimental measure that defines income thresholds and resources in a manner different from the official poverty measure. Though now being produced regularly by the U.S. Census Bureau, the SPM has not replaced the official poverty measure. Instead, the SPM offers an alternative understanding of the economic well-being of American families and of how federal policies affect those living in poverty. The official poverty guidelines are still used to determine eligibility for government programs and allocate public funds. A comparison with the official poverty measure helps to illustrate the importance of choices made about the unit of analysis in national statistics.

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In 2013, the most recent year of poverty estimates, the U.S. poverty rate was 15.5 percent using the SPM measure and14.6 percent using the official measure (Short, 2014). Indeed, since 2011, the SPM estimates have been greater than official estimates for the total population. The directional difference is not always consistent across subgroups. For instance, in 2011, the SPM estimate was lower than the official measure for Black people. The different estimates underscore the importance of detailing and critiquing the method of poverty measurement.

While much attention has been given to the definition of family needs (level of poverty thresholds) and the appropriate definition of available resources to meet these needs, there has been little discussion over the appropriate unit of analysis. The lack of debate does not reflect a consensus over what is the appropriate unit but rather an inability to explicitly judge whether one unit definition is better than another. This is not the objective of this paper. Instead this paper shows how updates to the unit of analysis result in different stories about which families are in poverty and which are not, underscoring the need for a debate over the appropriate unit of analysis.

This paper first reviews some of the previous research and recommendations on the unit of analysis for a poverty measure related to the creation of the SPM. This history is neither well-known nor well-documented. Then, this paper details how individuals are grouped into resource units for the SPM. A discussion of the characteristics of the units and people most affected by the change in the unit of analysis follows. The paper concludes with a discussion of areas for future research in order to improve the unit of analysis for the SPM.

2. THE CHANGING AMERICAN FAMILY

In recent decades, the structure of American families has changed. There has been an increase in cohabitation, single-parent families, multi-generation families, and nonfamily living arrangements. While cohabitation of unmarried partners has occurred for decades, there has been an increasing number of cohabiting partners. In 2002, nearly half of all women ages 15 to 44 lived with an unmarried partner (Chandra et al., 2005). While cohabitation with children present is a relatively new occurrence, it is also increasingly common (Chandra et al. 2005; Fitch, Goeken, and Ruggles, 2005; Kennedy and Bumpass, 2008; Mincieli et al., 2007; Schoen, Landale, and Daniels, 2007).

Kennedy and Bumpass (2008) use data from the 1995 and 2002 cycles of the U.S. National Survey of Family Growth (NSFG) to study recent trends in cohabitation. They find that nearly 20 percent of newborns in the late 1990s were to cohabiting couples, consisting of more than half of all births to unmarried mothers. Even children born to unmarried, non-cohabiting mothers are likely to live with their mother and a cohabitating partner at some point. If the treatment of unmarried partners in the unit of analysis is problematic, official estimates of poverty for this group are systematically biased.

The SPM adopts a broader definition for the unit of analysis to accommodate many of these structures which are not accounted for in the unit of analysis used for the official poverty measure. The official measure of poverty defines the unit of analysis as the primary family - a householder with at least one additional person who can be linked to the householder by birth, marriage, or adoption. Other household members who cannot be linked to the householder by birth, marriage, or adoption are considered unrelated individuals. If two or more unrelated individuals can be linked to each other, they comprise an unrelated subfamily. The official poverty measure's narrow definition of the primary family results in the exclusion of some people who are most at risk of being in poverty: unrelated children under the age of 15. These children are removed completely from the poverty universe.

In general, the unit of analysis for a poverty measure could be defined in a variety of ways to account for different degrees of resource sharing among unit members. At the extremes, each person could comprise a unit of analysis under the assumption that each household member is autonomous. Alternatively, all household members could be grouped together to determine poverty status at the household-level assuming complete resource sharing across household members. Using the family (wherein family members are restricted to those living within the same household and related by blood, marriage or adoption) as the unit of analysis offers researchers a unit of analysis that is between these two extremes.

The degree of resource sharing among household members is likely to vary and depend on the relationship between individuals. One of the early interagency investigations (Poverty Studies Task Force, 1976) of the appropriate unit of analysis for poverty measurement noted that while all people within a household enjoy economies of scale, there is great variability in the bond between individuals given the various possible relations. For instance, individuals related by birth, marriage, or adoption may be more likely to share resources than unrelated individuals without legal bonds.

More recently, the 1995 National Academy of Sciences (NAS) report (Citro and Michael, 1995) and the suggestions of the 2010 Interagency Technical Working Group (ITWG) recommended that the unit of analysis be amended to account for children in foster care, children under age 15 and unrelated to a household member, and cohabiting partners. The NAS panel recommended maintaining a family-level (as opposed to a household-level) unit of analysis for poverty determination but recommended that the family definition be expanded to include unrelated individuals under age 15 and cohabiting couples. The NAS report underscored that a cohabiting partner is an unmarried partner who is distinct from a housemate or roommate and that additional research was necessary to determine the extent of resource sharing among cohabiting partners.

Short and Smeeding (2005) addressed this question using data from the Survey of Income and Program Participation (SIPP). They found that cohabiting couples met the criteria established by the Consumer Expenditure (CE) survey for "consumer units." A consumer unit in the CE is defined as a family (related by blood, marriage, cohabitation, or adoption) or two or more individuals who share at least two of three major expenses: housing, food, or other living expenses. This finding is important since the SPM thresholds use CE data and are based on consumer units such that the resource measure is consistent with the thresholds.

In early 2010, the ITWG on Developing a Supplemental Poverty Measure drew on the recommendations of the 1995 report of the NAS Panel on Poverty and Family Assistance and subsequent research on poverty measurement to issue a series of suggestions on how to develop a new poverty measure. Observations of the ITWG included adjustments to the unit of analysis, estimation of the thresholds, and measurement of economic resources. Regarding the unit of analysis, the ITWG suggested that the thresholds be derived using expenditure data for consumer units and that resources be measured using a consistent unit of analysis. They also suggested that the resource unit include all related individuals who reside at the same address, any co-resident unrelated children who are cared for by the family, and any cohabiting partners and their children.

3. GROUPS INCLUDED IN RESOURCE UNITS FOR THE SPM

The unit of analysis for the SPM groups household members into resource units using a wider array of relationships. Any cohabiting partners, unrelated individuals under age 15, foster children under age 22, and related children over age 17 are joined with existing family units to create SPM resource units. Consequently, family units using the official measure of poverty are preserved but additional members of the household may join a resource unit or two non-family individuals may join to create a resource unit using the broader definition of resource unit for the SPM measure.

3.1 COHABITING PARTNERS

Cohabiting partners and their children comprise the same SPM resource unit. A cohabitating couple consists of two unrelated individuals who live in the same household, are over the age of 14, are not married, and identify each other as a boyfriend, girlfriend, or partner.

The Current Population Survey (CPS) began collecting data on cohabiting partners of the householder in 1996. (See Kreider (2008) for a good discussion). Unrelated individuals who are 15 years old or older and who are either not married or married with an absent spouse are asked whether they have a cohabiting partner in the household. In 2007, the survey question was improved to explicitly ask any unrelated, unmarried adults who live in the same household whether they have a boyfriend, girlfriend, or partner living in the household. The addition of the question in 2007 captured additional cohabiting partners of the householder who were not previously identified as the unmarried partner of the householder (Kreider 2008, 5-6).

There are two concerns related to the treatment of cohabiting partners as part of the same resource unit: the extent to which resources are shared and the stability of the relationship. Short and Smeeding (2005), using data from the SIPP, found that cohabiting couples are likely to share at least two major household expenses. Both the official poverty measure and the SPM use the household composition at the time of the survey to estimate the poverty status of individuals in the previous year. If the cohabiting relationship is very short term, it would be incorrect to aggregate the resources of the cohabiting couple to determine their poverty status. Bauman (1997) used data from the SIPP to analyze the duration of cohabiting couples, and found that approximately 75 percent of cohabiting partners stayed together for six months or longer. A more recent study found that the average cohabiting couple spends two years together (Kennedy and Bumpass, 2008). This research suggests that it is reasonable to include cohabiting couples and their families in the same SPM resource unit.

3.2 UNRELATED CHILDREN UNDER AGE 15

The unit of analysis for the SPM treats unrelated children who are in foster care differently from unrelated children not in foster care. That is, the official measure of poverty excludes unrelated children under age 15, some of whom are foster children, from the poverty universe. Children under age 15 who are unrelated to the reference person and not a child of some other household member are included in the householder's SPM resource unit. These unrelated children are not included in the poverty universe for the official poverty measure. The CPS does not ask income questions to persons under age 15 so there is no information on the child's income and so his or her poverty status cannot be determined. The SPM calculates a poverty status for unrelated children under age 15 by including these children in the same resource unit as the householder. Grouping unrelated children in the unit of the householder effectively assumes that the householder and any other members of the householder's resource unit pool resources with these unrelated children.

3.3 FOSTER CHILDREN UNDER AGE 22

The SPM also groups foster children under age 22 in the resource unit of the householder. There is legal justification for treating foster children under age 22 as part of the SPM resource unit. Under the Fostering Connections to Success and Increasing Adoptions Act of 2008, guardians of children in foster care are eligible to receive foster payments until the child is age 21 (United States Department of Health and Human Services, 2011).

The official measure treats foster care payments and foster care children inconsistently. The current official measure counts the householder's receipt of foster care payments in his or her income but does not count the foster child in the householder's resource unit. The householder's income is therefore increased by a sum equal to his or her foster payments but the householder's poverty threshold does not reflect the presence of the foster child. Furthermore, the official measure treats foster children age 15 to 21 as single person resource units. If these foster children have very little monetary income, they are highly likely to be counted as poor, even if they are living with foster parents who command considerable resources and who are in charge of their well-being.

The official measure also treats foster children differently based on their living arrangement. The CPS asks the householder about their relationship to each household member. While the householder has a wide range of possible responses, the respondent can only select one option. A householder with foster children in non-kinship care (foster children and caregiver are unrelated) will most likely identify the children as foster children since that is the only option to describe their relationship. A householder with foster children in kinship care (foster children and caregiver are related by birth or marriage), however, are related to the children in two ways but may only identify the children in one way. The householder may be more likely to identify their relationship with the children as through birth or marriage (e.g. as their daughter, grandson, or nephew) than as a foster child. Thereby undercounting the number of foster children and incorrectly characterizing their economic wellbeing. The directional bias is unclear given changes in family poverty thresholds and available resources to meet this threshold.

3.4 UNRELATED SUBFAMILIES

The official definition of a subfamily groups parents, spouses, and their children who are under age 18 into a family unit. Other family relationships, such as grandparent, sibling or cousin are not considered in the creation of a subfamily primarily because more detailed relationship information is not collected for household members who are not related to the householder.

Since 1989, only children under age 18 who were never married and have a parent present in the household have been included in a subfamily (U.S. Census Bureau, 1990). Children 18 years old or older who are unrelated to the primary family are treated as unrelated individuals even if their parent lives in the same household (and is not the householder). For example, consider two individuals who are not related to the householder: a 60 year old mother and her 25 year old son. The unit of analysis for the official measure would separate the mother and son into separate units. In contrast, the unit of analysis for the SPM would group the mother and son into a single resource unit.

Conditioning on the child's age may result in separation of some families into separate resource units. Consider a household consisting of five people. The householder lives with a roommate and the roommate's three children. The children are ages 16, 18, and 20. Using the official measure, the householder is identified as a householder with no relatives present. The roommate and his 16 year old child are a subfamily. The 18 year old and 20 year old children are unrelated individuals. Using the alternative definition of family for the SPM universe, this household consists of two resource units: the householder; and a subfamily (the roommate and his three children).

This example can be extended further to demonstrate how families with multiple generations are divided into multiple units using the official measure. Consider a household with eight people. The householder is married to another household member. The householder and spouse have no children. The third household member is the mother of three other household members who are aged 16, 18, and 34. The 34 year old daughter of the third household member is the mother of the two remaining household members. These children are ages 1 and 3, respectively.

Using the official definitions, this household consists of four resource units:

- the householder and his wife;
- the third household member and her 16 year old child;
- the third household member's 18 year old child; and
- the third household member's 34 year old child and her two children (ages 1 and 3).

The SPM definition of family reduces this household composition to two resource units:

- the householder and his wife; and
- the third household member, her children (ages 34, 18, and 16), and her grandchildren (ages 1 and 3).

The number of resource units in the household changes because the new definition of a subfamily is not conditioned on the age of the child.

In some households, a child lives with both parents but the parents are not married and do not identify as a cohabiting couple. The official measure would not group the child and both of her parents into the same unit. The SPM definition of the resource unit, however, includes all three people in the same resource unit based on their relationship to the child.

The limited data on family relationships outside members of the primary family will still limit the ability to link all members of unrelated subfamilies to resource units. Individuals can only be linked to the SPM resource unit of a subfamily if they are a cohabiting partner, spouse, parent, child, or foster child of a member of the subfamily. For example, two adult siblings who are not the head of household or related to the head of household will only be joined together if they have a parent present in the household. This is a data limitation since the SPM resource unit conceptually includes all individuals who are related by birth or marriage.

4. RESOURCE UNIT COMPOSITION ACROSS MEASURES

SPM resource units were created using data from the 2010 Current Population Survey Annual Social and Economic Supplement (CPS ASEC). The national estimates in this paper are based on responses to a household survey from a sample of the population. Approximately 100,000 households were included in the sample. Standard errors were calculated using replicate weights to correct for potential sampling error. Additional details regarding the sampling and accuracy of estimates have been summarized elsewhere (see United States Census Bureau (2010)). The new method of creating units of analysis results in 124.2 million resource units. More than 93 percent of all SPM resource units contain the same members as in their corresponding unit of analysis for the official measure. Approximately 8.1 million SPM resource units (6.5 percent) contain at least one more person than in the unit used for the official measure (see table 1).

A unit may grow as the result of any one or more of five possible changes in the definition of family, the inclusion of: (1) a cohabiting partner (and his or her family members), (2) an unmarried parent, (3) a biological child over age 17 in a subfamily, (4) a foster child under age 22, or (5) an unrelated individual under age 15 who is not a foster child. While a single resource unit may have changed for as many as all five reasons, in the 2010 CPS ASEC, no unit changed for more than three reasons. Of the units that changed, 76 percent changed for only one reason; 23 percent changed for two reasons; and less than one percent changed for three reasons.

Of the 8.1 million units that changed, 7.8 million units changed as a result of the presence of a cohabiting partner. Approximately 1.8 million units changed as the result of linking individuals to resource units through a related child. In some cases, the unit changed simply as a result of including related children over age 17 of a reference person of a subfamily (152,000 units changed). Unrelated children under age 15 who are not in foster care affected 292,000 resource units while 127,000 units changed as a result of including a foster child under age 22. The inclusion of unmarried parents in units changed 30,000 units.

Table 1: Reason for and number of resource units changed under the SPM

	Number	Standard error
Total	124,199	321.4
Unchanged from the official unit	116,103	317.3
Changed from the official unit	8,096	125.6
Number of reasons for resource unit change		
One	6,149	120.1
Two	1,893	56.1
Three	54	9.1
Reason for the change		
Cohabiting partner	7,818	123.4
Related children	1,831	55.0
Related children over age 18	152	18.5
Unrelated individual under age 15, not a foster child	292	20.9
Foster child under age 22	127	14.5
Unmarried parent	30	7.3
Official family types grouped		
Householder with no family present and unrelated individual	4,336	89.5
Primary family and unrelated individual	3,323	80.1
Householder with no family present and subfamily	124	14.3
Primary family and subfamily	89	11.2
Subfamily and unrelated individual	37	8.3
Two unrelated individuals	125	18.9
Primary family, subfamily, and unrelated individual	24	5.7
Householder with no family present, subfamily, and unrelated individual	39	6.5

Note: Numbers in thousands.

Of the 6.1 million units that changed for only one reason, cohabiting partners were the primary reason for a change in unit composition (96 percent or 5.9 million units). Fewer of these units changed because of the addition of an unrelated individual under age 15 who was not a foster child (101,000 units) or a foster child under age 22 (110,000 units). The inclusion of all individuals who can be linked through a related child resulted in approximately 47,000 new units.

Almost 95 percent of the 8.1 million changed units were altered by the addition of an unrelated individual to either a householder with no family present or a primary family (see table 2). These unrelated individuals may be cohabiting partners, unrelated children under 18, or children in foster care. Less than one percent of the new units were the result of the merger of a householder with no family present and a subfamily.

Table 2. Composition of SPM resource unit by family type defined using OPM

	Number	Standard error
Total changed from the official unit	8,096	125.6
Householder with no family present and unrelated individual	4,336	89.5
Primary family and unrelated individual	3,323	80.1
Householder with no family present and subfamily	124	14.3
Primary family and subfamily	89	11.2
Subfamily and unrelated individual	37	8.3
Two unrelated individuals	125	18.9
Primary family, subfamily, and unrelated individual	24	5.7
Householder with no family present, subfamily, and unrelated individual	39	6.5

Note: Numbers in thousands.

It was also uncommon for unrelated subfamilies and primary families or unrelated subfamilies and unrelated individuals to join the same resource unit. No unit changed as the result of two subfamilies creating a new unit (although such a change is possible). Less than 2 percent of all changed units were the result of two unrelated individuals joining a single resource unit. One percent of all changed units consist of a primary family, subfamily, and unrelated individual. A householder with no family present, a subfamily, and an unrelated individual comprised 1.5 percent of changed units.

There are 460,000 unrelated individuals under age 15 who are excluded from the poverty universe by the official poverty measure but are included by the SPM. Approximately 35 percent (or 161,000) of the unrelated individuals are children in foster care.

Children who are in foster care and 21 years old or younger were included in the householder's SPM resource unit. Of these 229,000 foster children, nearly 30 percent (approximately 68,000 foster children) are between 15 and 21 years old.

5. CHARACTERISTICS OF PEOPLE IN SPM RESOURCE UNITS

We consider the characteristics of people who change resource units as a result of the new definition of family. Most people, 280 million, do not change resource units when the broader definition of family is applied for the SPM unit of analysis. The remaining 24 million people are grouped into a SPM resource unit that is different from their unit using the official measure of poverty. Individual characteristics of people whose resource unit changed as a result of the new definition of family are compared to those of people whose resource unit did not change in table 3 and are discussed below.

5.1 RACE AND HISPANIC ORIGIN

The new definition of family disproportionately impacts non-White and non-Hispanic White people as measured by the distribution of people by race among resource units that changed compared to units that did not change.

Table 3. People in SPM resource units by selected characteristics

	Unchanged		Changed		Difference	
	Number	Standard error	Number	Standard error	Number	Standard error
Total	279,840	396	24,440	386	255,400	779
Race and Hispanic Origin						
White alone	223,098	359	19,305	346	203,793	699
White alone, not Hispanic	182,538	314	14,898	305	167,640	611
Black alone	35,106	153	3,518	151	31,588	303
Asian alone	13,532	109	479	43	13,052	136
Hispanic (any race)	44,021	169	4,880	168	39,141	337
Age						
Under 18	68,917	166	6,122	146	62,795	301
Under 15	56,733	134	5,379	132	51,355	265
15 to 17 years	12,184	84	743	38	11,441	99
18 to 64 years	173,092	316	17,535	280	155,557	578
18 to 21 years	15,092	154	1,708	66	13,384	191
18 to 24 years	25,654	132	3,659	105	21,995	223
25 to 34 years	35,344	154	5,741	141	29,604	293
35 to 44 years	36,907	99	3,540	96	33,367	193
45 to 54 years	41,328	98	3,060	98	38,268	196
55 to 59 years	18,222	72	950	49	17,272	111
60 to 64 years	15,637	111	586	36	15,052	124
Over 65 years	37,831	106	783	54	37,048	138
Residence						
Inside MSA	236,054	1,465	20,329	379	215,725	1,478
Outside MSA	43,786	1,425	4,111	206	39,675	1,328
Region						
Northeast	50,509	199	4,144	169	46,365	350
Midwest	60,228	238	5,868	212	54,360	437
South	104,116	289	8,196	238	95,920	508
West	64,987	201	6,231	183	58,756	365

Note. Numbers in thousands. MSA = Metropolitan statistical area

A smaller percent of people in changed units are non-Hispanic White (61 percent) compared to the percent of people in unchanged units who are non-Hispanic White (65 percent). This is also true for the percent of people who are Asian (2 percent of people in changed units and 5 percent of people in unchanged units). A greater percent of people in changed units are Black or Hispanic compared to the percent in unchanged units: 14 percent of people in changed units are Black compared to 13 percent of people in unchanged units; and 20 percent of people in changed units are Hispanic compared to 16 percent of people in unchanged units.

5.2 AGE

People of all ages were affected by the change of the family definition. Among children under age 18, the percent in changed units is not statistically different from the percent in unchanged units. Further decomposition of this age group reveals a statistically different distribution of children by age across units that changed and did not change. A larger percent of children under age 15 are in changed units (22 percent) compared to the percent of children of similar age in unchanged units (20 percent). In contrast, a larger percent of all people in changed units are children age 15 to 17 (4 percent) compared to children of similar age in unchanged units (3 percent). Thus, older children were most affected by changes in the family

People age 18 to 64 years old have the greatest likelihood of changing resource units. Approximately 72 percent of all people in changed units are 18 to 64 years old. This is greater than the percent of people in unchanged units of similar age (62 percent). A higher percent of people in changed units are 18 to 21 years old (7 percent) compared to the percent of all people in unchanged units of similar age (5 percent). People ages 18 to 24 comprise 15 percent of all people in changed units but only 9 percent of all people in unchanged units. This trend was also true for the percent of people ages 25 to 34 (23 percent of all people in changed units compared to 13 percent of all people in unchanged units). A higher percent of people age 35 to 44 are in changed units (14 percent) compared to the percent in unchanged units (13 percent). A smaller percent of all people in changed units are 45 to 64 years old (13 percent) compared to the percent of people in unchanged units of similar ages (15 percent).

Only 3 percent of people in changed units are age 65 or older. Of the 39 million people age 65 or older, 38 million are in units that do not change across poverty measures. Among all people in unchanged units, 14 percent are 65 years old or older.

5.3 RESIDENCE

The impact of a change in the definition of family also depended on where people resided. For instance, people living outside of a metropolitan statistical area were more likely to be assigned to a new resource unit than people living inside these areas. Among unchanged resource units,

84 percent of the people (236 million people) reside inside metropolitan statistical areas and 16 percent people (44 million people) reside outside these areas. People in changed units are more likely to reside inside a principal city (37 percent compared to 32 percent) and less likely to reside inside a metropolitan statistical area but outside a principal city (46 percent compared to 53 percent).

There were also differences by region of residence. A larger percent of people in the changed units reside in the Midwest (24 percent compared to 22 percent) and West (26 percent compared to 23 percent) compared to the percent of people in unchanged units residing in these regions. As a share of all people in changed units, a smaller percent of people reside in the South (34 percent) compared to the percent of all people in unchanged units who live in the South (37 percent). The percent of people in changed units who reside in the Northeast is not statistically different from the percent of people in unchanged units who live in this region.

6. UNRESOLVED ISSUES FOR FUTURE CONSIDERATION

The SPM is an experimental measure that defines the unit of analysis, income thresholds, and resources in a manner different from the official poverty measure. Each of these changes is likely to produce a different poverty estimate than estimates that use the official poverty measure. While poverty estimates are not discussed in this paper, a detailed description of the unit of analysis is provided in an effort to highlight assumptions of resource sharing in these estimates. Compared with the official measure, the unit of analysis for the SPM utilizes a wider array of relationships in order to classify household members into resource units. The U.S. Census Bureau may update its methodology to create resource units for the SPM as new information becomes available. Moving forward, there are at least three areas that will require additional research in order to validate the current methodology.

First, it is unclear at what age unrelated children should be treated as dependent from the householder's family unit. Among unrelated children, those in foster care who are under age 22 are included in the householder's resource unit while those not in foster care are included only if they are under age 15. Unrelated children who are not in foster care and 15 years old or older are considered to be autonomous from the householder's resource unit. There are 1.7 million unrelated individuals age 15 to 21 who are not in foster care. The inconsistency in the age cut-off across different types of unrelated children warrants more research in order to identify at which age unrelated children should be considered economically independent.

Second, further research is necessary to better understand resource sharing among cohabiting couples. The current method assumes that resources are shared for any cohabiting couple. This method was motivated by the observation that cohabiting couples exhibit fairly stable relationships and so should be treated similarly to married couples. But this assumption may only be valid for particular couples. For instance, cohabiting couples who recently moved in together may be less likely to share resources than couples who have lived together for some extended time period (e.g. six months, one year, etc.). Moreover, different relationships may exhibit different levels of stability. In a recent paper, Sherman (2009) requires that cohabiting partners live together for the previous 12 months before treating them as members of the same resource unit. Future research should consider the impact of the length of time a couple has cohabitated on their level of resource sharing.

Research on resource sharing has yet to consider variations in the degree of resource sharing among the resource unit members. Individuals in some resource units may each receive an equal share of the resources while a single individual in other resource units may consume all of the resources. In the latter case, it would be more accurate to treat each individual as an autonomous unit. It would be difficult, however, to allocate the costs of expenditures on jointly consumed goods (such as housing or durable goods). Individual analysis would also misrepresent the well-being of individuals without independent economic resources who are economically dependent on other household members.

Finally, it is unclear whether the unit of analysis should be based on the household. The U.S. Census Bureau currently uses the household as the principal unit of analysis when analyzing the distribution of income. This method is not consistent with the method to estimate poverty statistics, which are estimated at the family level. There is considerable debate over whether poverty measures should be based on related individuals, all people living at the same household, or some combination thereof. Assuming more complete resource pooling, all members of a household could be grouped as the unit of analysis. Assumptions about differences in the degree of resource pooling across various relationships are not necessary if the household is treated as the unit of analysis. Instead, a household measure would assume that all individuals in the household share resources. But this over simplification may incorrectly assume resource pooling among household members who do not share resources. Previous studies attempted to disentangle the extent of resource sharing among different household members but there is still no clear consensus on how to account for variation in resource pooling and joint consumption behaviors of household members (see Ruggles (1990) or Lazear and Michael (1988)).

Related, family members who share economic resources may reside in two or more locations. Resource units based on people in a single household, such as those used by the official measure and the SPM, fail to accurately capture the economic well-being of these people. Resource sharing is underestimated as is resource need. Future research should explore these unique and yet increasingly common family structures and economic dependencies (Dean, 2011). Indeed, as the SPM continues to develop and address the unresolved issues raised in this paper and other issues not yet identified, future research should continue to examine which people are most affected by changes in the unit of analysis.

REFERENCES

Bauman, Kurt. 1997. "Shifting Family Definitions: The Effect of Cohabitation and Other Nonfamily Household Relationships on Measures of Poverty." U.S. Census Bureau. Working paper.

Chandra, Anjani, Gladys Martinez, William Mosher, Joyce Abma, and Jo Jones. 2005. "Fertility, Family Planning, and Reproductive Health of U.S. Women: Data from the 2002 National Survey of Family Growth." National Center for Health Statistics. Hyattsville: 160. Vital and health statistics. Series 23, 25.

Citro, Constance F., and Robert T. Michael (eds). 1995. *Measuring Poverty: A New Approach*. Washington, D.C.: National Academy Press.

Dean, Yang. 2011. "Migrant Remittances." *The Journal of Economic Perspectives*, *25*(3): 129-151.

Fitch, Catherine, Ron Goeken, and Steven Ruggles. 2005. "The Rise of Cohabitation in the United States: New Historical Estimates." Minnesota Population Center, Working paper 2005-03.

Kennedy, Sheela and Larry Bumpass. 2008. "Cohabitation and Children's Living Arrangements: New Estimates from the United States." *Demographic Research*, *19:* 1663-1692.

Kreider, Rose. 2008. "Improvements to Demographic Household Data in the Current Population Survey: 2007." U.S. Census Bureau. Working Paper. http://www.census.gov/population/www/documentation/twps08/twps08.pdf

Lazear, Edward and Robert Michael. 1988. *Allocation of Income within the Household*. Chicago: University of Chicago Press.

Mincieli, Lisa, Jennifer Manlove, Molly McGarrett, Kristin Moore, and Suzanne Ryan. 2007. "The Relationship Context of Births Outside of Marriage: The Rise of Cohabitation." Child Trends. Brief 2007-13.

Observations from the Interagency Technical Working Group on Developing a Supplemental Poverty Measure (Interagency), 2010. http://www.census.gov/hhes/www/poverty/SPM_TWGObservations.pdf

Poverty Studies Task Force. 1976. “Technical Paper X, Effect of Using a Poverty Definition Based on Household Income.” U.S. Department of Health, Education and Welfare 1(34): 100.

Ruggles, Patricia. 1990. Drawing the Line: Alternative Poverty Measures and Their Implications for Public Policy. Washington, D.C.: The Urban Institute Press.

Schoen, Robert, Nancy Landale, and Kimberly Daniels. 2007. “Family Transitions in Young Adulthood.” *Demography*, *44*(4): , 807-820.

Seltzer, Judith, Charles Lau, and Suzanne Bianchi. 2012. “Doubling Up When Times are Tough: A Study of Obligations to Share a Home in Response to Economic Hardship.” *Social Science Research*, *41*(5): 1307-1319.

Sherman, Arloc. 2009. “Safety Net Effective at Fighting Poverty But Has Weakened for the Very Poorest.” Center on Budget and Policy Priorities. http://www.cbpp.org/cms/index.cfm?fa=view&id=2859

Short, Kathleen. 2014. “The Supplemental Poverty Measure: 2013” Current Population Reports. U.S. Census Bureau. https://www.census.gov/content/dam/Census/library/publications/2014/demo/p60-251.pdf

Short, Kathleen and Timothy Smeeding. 2005. “Consumer Units, Households and Sharing: A View from the Survey of Income and Program Participation (SIPP).” U.S. Census Bureau. Working paper. http://www.census.gov/hhes/www/povmeas/papers/consumerunits.pdf

United States Census Bureau. 2010. “Source and Accuracy of Estimates for *Income, Poverty, and Health Insurance Coverage in the United States: 2010*.” https://www.census.gov/hhes/www/p60_239sa.pdf

United States Census Bureau. 1990. “Household and Family Characteristics: March 1990 and 1989.” Current Population Reports Series P-20, No. 447. http://www.census.gov/population/socdemo/hh-fam/p20-historical/P20447.pdf

United States Department of Health and Human Services. 2011. “Implementation of the Fostering Connections to Success and Increasing Adoptions Act of 2008.” http://www.acf.hhs.gov/programs/cb/laws_policies/implementation_foster.htm

Credit Union Lending Following the Financial Crisis

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ABSTRACT

The 2008-09 Financial Crisis adversely affected financial institutional lending, deepening the recession. Credit union lending became stagnant, but the change in lending varied among credit unions. This paper examines factors that influenced credit union lending between 2008 and 2010. State unemployment rates along with the levels and changes of net worth were negatively associated with lending, as were levels and changes of charge-offs and delinquent loans. Apparently, the negative effect of net worth on lending was particular to the low interest rate environment. On the other hand, loan rates, credit union size and risk-based lending were positively associated with lending.

INTRODUCTION

Financial crises obviously adversely affect financial institutions and credit. During the Great Depression of the 1930's, bank credit greatly decreased as the number of banks fell by about 50 percent (Ryder and Chambers, 2009). Credit unions, however, seized this opportunity to grow and consequently the number of credit unions increased by 107 percent during this time period (Ryder and Chambers, 2009). While the growth in credit unions helped eligible workers and their families obtain credit, the effect was relatively small as both the number and size of credit unions were quite small at the time. As of 1939, there were just 2.3 million credit union members. By 2011, this number had grown to 94.0 million (Credit Union National Association, 2012b).

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When the financial crisis hit the U.S. in 2008, loan growth for banks turned negative while credit union loan growth slowed considerably (Smith and Woodbury, 2010). Credit union loan growth eventually turned negative in 2010, for the first time since 1942 (Filene Research Institute, 2011). Although both credit union and bank lending are affected by business cycles, Smith and Woodbury (2010) showed that from 1986 to 2009, the impact was larger for bank lending. Credit union lending, although still relatively small in comparison to banks, became a more important source of consumer credit over time as credit union membership and average credit union size increased. Table 1 shows total credit union saving deposits held and loans outstanding for 2005 to-2011.

Table 1. United States Credit Unions: Number, Total Savings, and Total Loans, 2005-2011.

Year	# of Credit Unions	Savings (Billions of $)	Loans (Billions of $)	Loans-to-Savings Ratio
2005	9,011	596.6	473.7	79.4 %
2006	8,662	621.1	510.8	82.2 %
2007	8,267	646.8	539.5	83.4 %
2008	8,088	698.0	580.1	83.1 %
2009	7,831	769.8	587.1	76.3 %
2010	7,728	810.9	584.3	72.1 %
2011	7,351	845.9	586.6	69.3 %

Source: Credit Union National Association, *Annual Credit Union Data.*

A number of studies have examined credit union asset growth as a performance variable. These include Ward and McKillop (2005), Goddard and Wilson (2005), Goddard, McKillop, and Wilson (2008) and Tokle and Tokle (2010). The 2008-09 Financial Crisis brought renewed concern about a “credit crunch,” and loan growth became an important determinant of the economic recovery. Of course while credit union lending was flat during 2009-11, not all credit unions responded in the same way with respect to lending in the aftermath of the financial crisis.

In sum, the 2008-09 Financial Crisis brought a renewed interest in lending while credit unions became a more important source of credit. But lending changes varied among credit unions. This paper examines factors that may have influenced these differences in lending by individual credit unions during the financial crisis. We begin with a brief literature review, followed by a description of the model and variables with explanations of expected effects based on results of previous studies. The sample, descriptive statistics of the variables, and results follow.

LITERATURE REVIEW

A number of studies examined factors that influence lending by banks, at both the state and bank levels. We did not find any studies that only analyzed the determinants of lending by credit unions. This literature review contains a brief summary of recent research on bank lending.

Bernanke and Lown (1991) is an often-cited study on lending in the aftermath of a credit crunch in the U.S. They tested a claim made in Congressional testimony by Richard Syron that the credit crunch in New England, which followed a collapse in real estate prices in the early 1990s, was caused by a shortage of bank capital (p. 221). They first examined state-level loan growth and found that the capital-asset ratio and employment growth were significant explanatory factors. Individual bank data revealed the same result, with a particularly strong association between loan growth and the capital-asset ratio for small banks. Although they found that "declines in bank capital have contributed to the slowdown in lending," they noted that their statistical results were significant but "not . . . extremely large either" (p. 228).

Two decades and a nationwide real estate bubble later, Berrospide and Edge (2010) studied the effect of capital on lending by bank holding companies. They too found "relatively modest effects" of capital on loan growth, with economic activity and "perception of riskiness" playing more important roles (p. 52). Smith and Woodbury (2010) analyzed the effects of the business cycle on bank and credit union delinquencies, charge-offs and lending between 1986 and 2009. They found that while a change in the unemployment rate had no effect on credit union lending, an increase in the unemployment rate led to a decrease in loan growth for banks.

Carlson, Shan and Warusawitarana (2011) found that banks with higher capital ratios had stronger loan growth during the recent financial crisis, but that this association was absent prior to 2008. Their study also showed that "the relationship between capital ratios and loan growth is nonlinear;" capital ratios "have a notably larger impact on loan growth when the capital ratio of the bank is low than when it is high," (p. 4). Macit (2012) used quarterly loan growth to test whether conventional banks or participation (Islamic) banks differed in response to changes in monetary policy in Turkey and also found that more liquid banks realized higher loan growth (p. 13).

THE MODEL

This paper examines which independent variables had an effect on the change in credit union lending in the aftermath of the 2008-09 Financial Crisis. Table 1 shows that while growth in credit union lending was robust during 2005-08, it became stagnant, but stable during 2008-11. Furthermore, during this time period credit union saving increased as credit union members looked for a safe harbor for their savings. As a result, the loan-to-savings ratio decreased from around 83 percent in 2007 and 2008 to about 69 percent in 2011. A "credit crunch" followed the 2008-09 Financial Crisis, as financial institutions tightened their lending standards in the face of higher unemployment rates and greater default risk.

Dependent Variables: Percentage Change in Loans (ΔLoan), year-end 2008 to year-end 2009 and year-end 2008 to year-end 2010.

Independent Variables:

1) State Unemployment Rate (UnRate). The unemployment rate is used to approximate differences in economic conditions between states. Smith and Woodbury (2010) found using a simple regression of loan growth on the unemployment rate for 1986-2009 that a 1 percent increase in the unemployment rate led to a 1.15 percent decrease in loan growth for banks, while it had no effect on credit union loan growth. Berroside and Edge (2010) found that higher GDP growth, which is negatively related to unemployment, increased loan growth for bank holding companies. Also, Bernanke and Lown (1991) showed that higher employment growth led to higher loan growth.

Although Smith and Woodbury found evidence that credit union lending was less sensitive to business cycles than banks during the 25-year period between 1986-2009, we expect that credit unions in states that had a higher unemployment rate during and following such a severe financial crisis had less loan demand as well as a higher credit risk, and, ceteris paribus, may have made fewer loans.

2) Net-Worth/Total Assets (NW/Assets). Depository institutions with higher net-worth ratios (essentially higher capital ratios) have, ceteris paribus, higher lending capacities. This is one reason why the U.S. Treasury required large banks to take capital injections from the Troubled-Asset Relief Program during the 2008-09 Financial Crisis. Using panel regression techniques for bank-holding companies, Berroside and Edge (2010) found that capital ratios had small but positive effects on lending, and Francis and Osborne (2009) found that in the United Kingdom, capital shortfalls modestly reduced bank lending. In addition, Bernanke and Lown (1991) found support for a direct relationship between bank capital ratios and subsequent lending growth.

Also, Carlson et al. (2011) found that banks with higher capital ratios had stronger loan growth in 2008 and 2009 (during the financial crisis), but that this relationship did not hold up during the years preceding the financial crisis. In addition, during economically unstable times, depository institutions often try to maintain capital ratios by decreasing asset size, and thus decrease lending.

On the other hand, the lowest interest rate environment since the 1930s may have caused some unusual effects. Credit unions with a lower net-worth ratio may have tried extra hard to make loans following the 2008-09 Financial Crisis. This is because with investments paying near-zero percent rate of returns due to the Federal Reserve's monetary policy, their best chance to increase net-income and hence build net worth was to make more loans, thereby increasing their loans/asset ratio while decreasing their investments/asset ratio.

In sum, we would typically expect net-worth ratios to have a positive effect on lending. However, with returns on investments at near zero levels during the recent financial crisis, credit unions with lower net-worth ratios may have been more aggressive in making loans, trying to generate more net income. Hence, we hypothesize that during this unusual time period that the net-worth ratio variable is a 2-tailed test.

3) Change in Net-Worth/Total Assets (∆NW/Assets). Changes and levels of a single variable are often independent of each other and used together as explanatory variables in an economic model (see Tokle et al. 1990). Bernanke and Lown (1991) added a change in capital ratios variable to their loan growth model, which turned out to be insignificant. Credit unions with increasing net-worth ratios may have felt that they had the means to try to increase their lending. On the other hand, credit unions with a falling net-worth ratio may have tried extra hard to make loans to reverse the decline in their net-worth ratios by generating more net-income in such a low interest-rate environment. And some credit unions may have worked to improve or maintain their net-worth ratios by decreasing assets (the denominator). This is often accomplished by making fewer loans. Hence, as was the case with the impact of net-worth ratios, we hypothesize that the change of net-worth ratio also requires a 2-tailed test.

4) Investments/Assets (Invest/Assets). Berroside and Edge (2010) found a similar variable, securities-to-assets, to positively affect bank holding company loan growth. Macit (2012) found that more liquid banks in Turkey had stronger loan growth. In addition, the Federal Reserve Bank, through its monetary policy, lowered short-term interest rates to near zero by late 2008, and rates were expected to stay there for an "extended time period." Most investments made by credit unions are also short-term in nature. Hence, we expect that credit unions with a larger percentage of assets in investments may be trying harder to make loans which yielded a significantly higher return, and therefore that the investments/assets ratio will have a positive effect on loan growth.

5) Fee Revenue/Total Assets (Fees/Assets). Revenue from fees has become an increasingly important source of revenue for credit unions in recent years. Fee income increased from 35 basis points in 1989 to 86 basis points in 2008 (Credit Union National Association, 2012a). On one hand, credit unions with higher fee revenue may have less pressure to earn revenue from loans. On the other hand credit unions with higher fee revenue may be under pressure to increase net income to maintain or build net worth and be working harder to also make new loans as well as maintaining a higher fee revenue/asset ratio. Hence, the Fees/Asset ratio is a two-tailed test.

6) Net Charge-Offs/Average Loans (Charge/Loans). Higher charge-offs imply higher credit risk and could cause a credit union to tighten lending standards. Also, Berroside and Edge (2010) found that net charge-offs/assets had a significant and negative effect on loan growth for bank holding companies. Consequently, we expect higher charge-offs to result in lower loan growth.

7) Change in Net Charge-Offs/Average Loans (∆Charge/Loans). By the same reasoning as for level of charge-offs, we expect an increase in net charge-offs/average loans to result in lower loan growth.

8) Delinquent Loans/Total Loans (Delinq/Loans). Delinquent loans also indicate higher credit risk, as some will eventually be charged-off. Goddard et al. (2002) also found that high levels of bad debt may indicate a poorly managed credit union. Similarly to charge-offs, we expect a higher rate of delinquent loans will lead to lower loan growth.

9) Change in Delinquent Loans/Total Loans (∆Delinq/Loans). By the same reasoning as for level of delinquent loans/total loans, we expect an increase in delinquent loans /average loans to result in lower loan growth.

10) Credit Union Size (Size). Among other sources, changes in technology and increased regulation from legislation such as the USA Patriot Act, the Bank Secrecy Act and the Dodd-Frank Act have increased the credit union size needed to achieve economies-of-scales in recent years. For example, Wilcox (2006) showed the noninterest expense ratio between large and small credit unions increased over the 1980-2004 time-period. He also found that larger credit unions use part of this lower cost to benefit their members with lower interest rates on loans (Wilcox, 2006). And Wheelock and Wilson (2011) showed, using a rigorous nonparametric local-linear model to estimate credit union costs, that "the vast majority of credit unions- almost all, in fact- operated under increasing returns to scale" (p. 1358). We expect that a larger credit union will have lower average costs, which in turn allows them to offer loans at lower rates, and hence increase loan volume. Size is measured by the log of total credit union assets.

11) Risk-Based Loans (RBLoans). (1 = yes, 0 = no). Credit unions that use risk-based lending charge lower interest rates for members who borrow with higher credit scores (a proxy measure for credit risk). Likewise, members with a lower credit score (and a higher credit risk) pay higher rates. Hence, credit unions that use risk-based lending should be able to increase their loan volume for a couple of reasons. First, they may make more loans at lower rates to members with good credit scores who may otherwise look elsewhere for loans. Second, they may also make more loans at higher rates to members with poor credit scores, who might otherwise be turned down by the credit union due to the anticipated higher cost of loan collections and charge-offs (Tokle, Tokle, and Picard, 2003). We expect that credit unions with risk-based lending will increase loan volume.

12) Indirect Loans (IndirLoans) (1 = yes, 0 = no). Typically, credit union indirect consumer lending takes place for vehicle loans. Such loans are actually made, indirectly, at the dealership for a fee paid by the credit union. This helps to facilitate loans due to a convenience factor, especially during evenings and weekends when credit unions tend to be closed or have limited lobby hours. At year-end 2011, 25.5 percent of all credit unions made indirect loans, but this varied by credit union size (Credit Union National Association, 2012a). For example, only 0.9 percent of the credit unions in the $10-20 million asset-size category made indirect loans, while 79.3 percent of the credit unions over $1 billion in asset size category made indirect loans (Credit Union National Association, 2012a). Staten, Otis and Umbeck (1990) wrote that "the theory implies that commercial banks use indirect lending for consumer durables to reduce the costs of lending across risk categories" (page 527). Hence, we expect that credit unions with indirect lending will increase loan volume.

13) Yield on Average Loans (LoanYield). According to the loanable funds theory, lenders will supply a larger amount of loanable funds at higher interest rates (Hubbard and O'Brien, 2014, pp. 110-111). Also, the degree of local depository institution competition can cause some variation in local market loan rates (Tokle, Fullerton and Walke, 2015). We expect that everything else equal, a higher yield on average loans will lead to a larger supply of loans.

The model used in this study is expressed in Equation 1:

(1)ΔLoan = a_o + a_1UnRate + a_2 NW/Assets + $a_3\Delta$NW/Assets + a_4 Invest/Assets + a_5Fees /Assets + a_6Charge/Loans + $a_7\Delta$Charge/Loans + a_8Delinq/Loans + $a_9\Delta$ Delinq/Loans + a_{10}lnSize + a_{11}RBLoans + a_{12}IndirLoans + a_{13}LoanYield

THE SAMPLE

Credit union data on was obtained from NCUA records via Peer-to-Peer by Callahan and Associates. Approximately 80 credit unions had one or more pieces of information missing and were not used in the final models. Twenty of the credit unions greater than $1 billion in asset size that branched over multiple state lines were excluded since the independent variable, state unemployment rate, would have less meaning.

We also excluded credit unions with less than $2 million in assets, which were characterized by Tokle and Tokle (2014) as "very small credit unions" because their operating model is quite different than the rest of the industry. For example, Tokle and Tokle (2014) found that in 2007 that these very small credit unions on average had only 381 members, while only 7.0 percent offered checking deposits, 6.6 percent offered real estate loans, 2.4 percent offered credit cards and 1.6 percent offered money markets deposits while their average net-worth ratio was nearly double the industry average at 20.9 percent. In contrast, credit unions with an asset size greater $2 million typically offered the above products while the average net-worth ratio of all credit unions in 2007 was 11.5 percent (Credit Union National Association, 2007). The final models included about 5,900 credit unions.[1]

Tables 2 and 3 report descriptive statistics on each of the variables. Table 2 reports descriptive statistics for change variables, while Table 3 reports descriptive statistics for variables that were measured at one point in time. All values were taken from the fourth quarter, so variables measured at one point in time used the fourth quarter of 2008; change variables were calculated as the difference or in the case of the dependent variable, the percentage change, between either the fourth quarter of 2008 and the fourth quarter of 2009, or between the fourth quarter of 2008 and the fourth quarter of 2010. Assets are reported here in dollars but were transformed to natural logarithmic units in the model.

Descriptive statistics for the dependent variable are reported in the first row of Table 2. Between the fourth quarter of 2008 and the fourth quarter of 2009, loans grew on average 2.45 percent for this sample of credit unions. Between the fourth quarter of 2008 and the fourth quarter of 2010, growth was slightly less at 2.08 percent, suggesting that most of the growth over the two year period occurred in the first year. The standard deviation was larger for the two-year period than for the first year alone, increasing to 20.60 percent from 12.18 percent.

The other change variables, measured as a change of ratios, are reported in Table 2. They confirm what one would expect, that both the ratio of charge-offs/assets and delinquent loans/assets increased over both the one-year and two-year periods in question, while the ratio of net worth/assets fell over the same period as the impact of the financial crisis was felt.

Table 2. Descriptive Statistics of Change Variables, 2008-09 and 2008-10 (change from quarter 4 to quarter 4)

Variable	**2008-09 mean**	**2008-09 standard deviation**	**2008-10 mean**	**2008-10 standard deviation**
Percentage change in loans	2.45	12.18	2.08	20.60
Change in charge-offs/assets	0.0020	0.0093	0.0015	0.0099
Change in net worth/assets	-0.0123	0.0131	-0.0154	0.0177
Change in delinquent loans/assets	0.0024	0.0159	0.0017	0.0178

Table 3 reports variables that are measured at one point in time, the fourth quarter of 2008. At that time, the average state unemployment rate was about 5.6 percent. The average asset size of credit unions in this sample was almost $132 million; note that the median asset size was $23 million reflecting the fact that while most credit unions are smaller financial institutions, a number of very large credit unions pull up the mean. The largest credit union in this sample had assets of over $36 billion.

The average net worth ratio of credit unions in this sample was over 14 percent. The National Credit Union Administration considers credit unions with a net worth ratio of 7 percent or higher to be “well capitalized.” The ratio of investments-to-assets was about 33 percent; fee revenue-to-assets was less than 1 percent. Net charge-offs to assets was about 0.6 percent; less than 2 percent of loans were delinquent. Nearly 60 percent of the credit unions in this sample offered risk based loans. About 29 percent offered indirect loans. Lastly, the average loan yield was 7.26 percent.

Table 3. Descriptive Statistics of Static Variables, 2008:Q4

Variable	Mean	Standard deviation
State Unemployment Rate (percent)	5.58	1.17
Net Worth/Assets (percent)	14.12	5.59
Investments/Assets (percent)	32.97	16.88
Fee Revenue/Assets (percent)	0.82	0.75
Net charge-offs/assets (percent)	0.64	0.79
Delinquent loans/Assets (percent)	1.67	1.89
Asset Size	$131,890,369	$663,351,654
Risk-based loans (1 = yes, 0 = no)	0.5984	0.4903
Indirect loans (1 = yes, 0 = no)	0.2892	0.4534
Loan yield (percent)	7.26	1.19

RESULTS

Results for two OLS regression models are reported in Table 4. The dependent variable of the first model is the percentage change in loan growth for 2008-09, and for the second model is the percentage change in loan growth for 2008-10. We ran regressions for both time periods to add to robustness of the results. Both time periods yielded similar results. The natural logarithm of asset size was used rather than the dollar amount of assets. Homoscedasticity was assessed. Using a residual plot, variation appeared to be constant across both predicted and actual values of the dependent variables.

Table 4. Dependent variables: Loan growth 2008-09 and loan growth 2008-10**.**

Predictor	2008-09 Coefficient	SE Coefficient	p-value	2008-10 Coefficient	SE Coefficient	p-value
Constant	-0.18224	0.02876	0.000	-0.35963	0.04929	0.000
1. State Unemployment Rate	-0.3034	0.1288	0.010	-0.8464	0.2200	0.000
2. Net Worth/Assets	-0.20578	0.03103	0.000	-0.34368	0.05361	0.000
3. Change in Net Worth/Assets	-1.5350	0.1181	0.000	-2.0376	0.1529	0.000
4. Investments/Assets	-0.0068	0.01013	0.251	-0.0164	0.01728	0.172
5. Fee Revenue/Assets	0.6062	0.2280	0.008	1.3621	0.3896	0.000
6. Net Charge-offs/Assets	-4.0831	0.2502	0.000	-6.6282	0.4224	0.000
7. Change in Net Charge-offs/Assets	-4.1360	0.1949	0.000	-5.3772	0.3070	0.000
8. Delinquent Loans/Total Loans	-0.41632	0.09309	0.000	-0.9186	0.1611	0.000
9. Change in Delinquent Loans/Total Loans	-0.83905	0.09626	0.000	-0.9603	0.1528	0.000
10. Ln Assets	0.00835	0.0013	0.000	0.016256	0.002243	0.000
11. Risk-based Loans	0.00948	0.00338	0.002	0.01175	0.005774	0.021
12. Indirect Loans	0.010765	0.00409	0.015	0.005406	0.00698	0.220
13. Loan Yield	1.6868	0.1541	0.000	3.0204	0.2620	0.000

2008-09: R-square = 13.9%; F = 72.99; p-value = 0.000; n = 59092008-10: R-square = 12.1%; F = 62.43; p-value = 0.000; n = 5909

All of the variable coefficients had their expected signs and were significant, with two exceptions. The investments/assets ratio was expected to positively affect loan growth. While this coefficient was negative for both time periods, it was not significant for either one. Other factors equal, apparently credit unions with a larger percentage of assets in investments were not granting more loans which yielded a significantly higher return. Possibly, due to local economic conditions, loan demand was not strong enough for some credit unions to increase loans, even if they had a higher percentage of assets in investments than they wanted. Secondly, the indirect loans variable coefficient had its expected sign but was not significant for the 2008-10 model.

As expected, higher state unemployment rates had a negative effect on loan growth for both time periods. Credit unions in states with higher unemployment rates probably saw weaker loan demand and likely experienced higher credit risk.

Although in past banking studies higher capital ratios were associated with higher loan growth, we found that credit unions with a higher net worth ratio and/or with an increasing net-worth ratio were associated with a decrease in lending during both time periods. As hypothesized above, credit unions with a low and/or falling net-worth ratio may have tried to make more loans and generate more net-income in such a low interest-rate environment, while other credit unions may have tried to maintain net-worth ratios by decreasing assets (the denominator of the ratio), which is often accomplished by making fewer loans.

The coefficient of fee revenue/assets was positive and significant for both time periods. Credit unions with higher fee revenue may have been under pressure to increase net income and hence worked to make new loans in such a low rate environment.

Both level and changes in the net charge-offs/assets and delinquent loans/total loans variables had their predicted signs and were significant for both time periods, although the coefficients for both level and change in charge-offs/assets were much larger, indicating a larger effect. Higher loan charge-offs and loan delinquencies had the effect of discouraging credit unions from making new loans during both time periods. Credit unions facing higher credit risks probably tightened lending standards and became more conservative in general in underwriting loans.

As expected, the coefficient for credit union size was positive and significant for both time periods. Economies-of-scale advantages and the resulting lower average costs resulted in higher loan growth for credit unions. In addition, the risk-based loan coefficient was positive and significant for both time periods. Credit unions that offered risk-based loans experienced higher loan growth because they could offer better loan rates to their low credit-risk members and still make loans to their higher credit-risk members at somewhat higher loan rates.

There was some evidence that credit unions that offered indirect lending experienced higher union loan growth, as the indirect lending coefficient was positive, but significant for only the 2008-09 period. Finally, a positive and significant coefficient for average loan yield indicated that a higher loan yield encouraged more lending, as expected.

CONCLUSIONS

The credit union industry weathered the recent financial crisis in the United States fairly well, in some respects better than the banking industry, even though the number of credit unions continued a long-established pattern of falling while the industry asset size rose. Credit union lending slowed during the 2008-09 Financial Crisis, but did not fall as much as bank lending. While the credit union industry is small relative to the banking industry, it remains an important source of funds for many consumers, especially in times of tight credit.

This paper examined the factors that influenced credit union loan growth between 2008 and 2010. Economic conditions, using a proxy measure of the state unemployment rate, had the expected effect on loan growth; credit unions in states with higher unemployment rates had lower loan growth than credit unions in states that suffered less from the recession.

Asset size had the expected effect, as larger credit unions experienced higher loan growth than smaller credit unions. The share of assets in investments was the only variable that did not have the hypothesized effect.

The question of whether levels and changes in the net-worth ratio causes credit union loan growth to increase or decrease has yet to be settled, but this study found that during 2008-2010, credit unions with higher net worth ratios experienced lower loan growth. Credit unions with low net-worth ratios may have tried to make more loans in order to generate more net income during a time period when investments available to credit unions were paying near zero interest rates. A positive change in the net-worth ratio had a negative effect on loan growth, for a given net-worth ratio. In order to maintain a well-capitalized net-worth ratio, some credit unions may have reduced their assets, by making fewer loans, leading to decreased loan growth.

The level and the change in the ratio of delinquent loans to total loans and in net charge-offs to loans also behaved as predicted, in that increases in both the level and the change in these variables had dampening effects on loan growth. Credit unions with more delinquent loans and more charge-offs experienced lower loan growth, as these institutions likely had to tighten lending standards and became more conservative in making loans.

The use of risk-based lending, indirect lending, and fee revenue all contributed to positive loan growth, although indirect lending was not significant for the 2008-2010 time period. These sources of revenue tend to be used by institutions that actively seek new ways to grow, and may be indicative of different management styles and philosophies. Lastly, as expected, higher loan rates led to higher loan growth.

While most of the variables had the hypothesized effect on loan growth, much of the variation in loan growth for these credit unions remains unexplained. Future research could focus on identifying other factors that may explain loan growth, or examine how the influence of these factors changes under different economic conditions.

ENDNOTES

1. We also ran both regressions dropping the largest credit unions ($6 to $36 billion) from the sample to examine whether the largest credit unions may have been also atypical and skewed the results. These results showed that all of the coefficients and SE coefficients remained nearly identical. We concluded that there was no need to drop the largest credit unions. These additional results are available on request.

REFERENCES

Bernanke, Ben S. and Cara S. Lown. 1991. "The Credit Crunch." *Brookings Paper on Economic Activity 2:* 205-247.

Berroside, Jose M. and Rochelle M. Edge. 2010. "The Effects of Bank Capital on Lending: What Do We Know, and What Does it Mean?" *International Journal of Central Banking*, 6 (4): 5-54.

Carlson, Mark, Hui Shan and Missaka Warusawitarana. 2011. "Capital Ratios and Bank Lending: A Matched Bank Approach." *Finance and Economics Discussion Series*. Federal Reserve Board, Washington, D.C.

Credit Union National Association. 2007. *Credit Union Report, Year-End 2007*. Madison, Wisconsin.

Credit Union National Association. 2012a. *Credit Union Report, Mid-Year 2012*. Madison, Wisconsin.

Credit Union National Association. 2012b. *Annual Credit Union Data, Long-Run Trends.* Madison, Wisconsin.

Filene Research Institute. October 24, 2011. "Credit Union Sustainability, Costs, Consolidation and Differentiation, a Credit Union Research Colloquium." Madison, Wisconsin.

Francis, William, and Matthew Osborne. 2009. "Bank Regulation, Capital and Credit Supply:

Measuring the Impact of Prudential Standards." *Occasional Paper* No. 36, UK Financial Services Authority.

Goddard, John, Donal McKillop, and John Wilson. 2008. "What Drives the Performance of Cooperative Financial Institutions? Evidence for US Credit Unions," *Applied Financial Economics*, 18: 879-893.

Goddard, John and John Wilson. 2005. "US Credit Unions: An Empirical Investigation of Size, Age and Growth," *Annals of Public and Cooperative Economics*, 76 (3): 375-406.

Goddard, John, Donal McKillop, and John Wilson. 2002. “The Growth of US Credit Unions.” Journal of Banking and Finance, 26 (12): 2327-2356.

Hubbard, Glen R. and Anthony Patrick O’Brien. 2014. *Money, Banking and the Financial System.* Pearson: Boston.

Macit, Fatih. 2012. “Who Responds More to Monetary Policy, Conventional Banks or Participation Banks?” *Journal of Economics, Finance and Administrative Science*, 17 (33): 10-14.

Ryder, Nicholas and Clare Chambers. 2009. “The Credit Crunch- Are Credit Unions Able to Ride Out the Storm?” *Journal of Banking Regulation*, 11: 76-86.

Smith, David M. and Stephen A. Woodbury. 2010. “Withstanding a Financial Firestorm: Credit Unions vs. Banks.” Research Brief, Filene Research Institute, Madison, Wisconsin.

Staten, Michael E., Otis W. Gilley and John Umbeck. 1990. “Information Costs and the Organization of Credit Markets: A Theory of Indirect Lending.” *Economic Inquiry*, 28: 508-529.

Tokle, Robert J., Richard T. Rogers and Jean W. Adams. 1990. “Advertising Intensity and Concentration Change in Manufacturing Industries.” *Midwestern Journal of Business and Economics*, Spring: 1-14.

Tokle, Robert J., Joanne Tokle and Robert R. Picard. 2003. “Risk Based Pricing at the Portneuf College Credit Union.” *Journal of the International Academy for Case Studies*, 9 (1): 63-71.

Tokle, Robert J. and Joanne G. Tokle. 2010. “Credit Union Growth in Mid-sized Markets.” *New York Economics Review*, 41: 45-56.

Tokle, Robert J. and Joanne G. Tokle. 2014. “The Status of Very Small Credit Unions after the 2008 Financial Crisis.” *New York Economics Review*, 45: 36-46.

Tokle, Robert J., Thomas M. Fullerton, Jr, and Adam G. Walke. 2015. “Credit Union Loan Rate Determinants following the 2008 Financial Crisis.” *The Social Science Journal*, 52: 364-373.

Ward, Ann-Marie, and Donal G. McKillop. 2005. “The Law of Proportionate Effect: The Growth of the UK Credit Union Movement at National and Regional Level,” *Journal of Business Finance and Accounting*, 32 (9 and 10): 1827-1859.

Wheelock, David C. and Paul W. Wilson. 2011. “Are Credit Unions Too Small?” *The Review of Economics and Statistics,* 93(4): 1343-1359.

Wilcox, James A. 2006. “Performance Divergence of Large and Small Credit Unions.” *Federal Reserve Band of San Francisco Economic Letter*, August 4: 1-4.

Impact of the US Budget Deficit and the Labor Productivity-Compensation Gap on ROE

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ABSTRACT

This paper studies the effects of the US annual budget deficit as the ratio of annual GDP and the labor productivity-compensation gap on ROE (rate of return on equity). Cointegration methodology is implemented using annual data from 1976 through 2011. The variables in levels are nonstationary depicting I(1) behavior. Both λ_{trace} and λ_{max} tests confirm a cointegrating relationship among variables. The estimates of the Vector Error-Correction Model (VECM) support discernible long-run convergence and causal flows with relatively weak short-run net positive interactive feedback effects. Dynamic OLS (DOLS) and Fully Modified Ordinary Least Squares (FMOLS) estimates also support the above findings.

INTRODUCTION

The corporate sector plays a vital role in the US economy. The contribution to the economy is dependent on its financial performance in terms of profitability. Amid a host of financial ratios, the most commonly used measures of corporate profitability are ROA (return on assets) and ROE (return on stockholders' equity). ROE is more comprehensive than ROA because its three-step and five-step DuPont calculations include ROA (see, Appendix-A). The overall ROE is standardized relative to the firm size. In these calculations, ROE includes operating efficiency (as measured by profit margin), asset use efficiency (as measured by total asset turnover), financial leverage (as measured by the equity multiplier), interest burden and tax management efficiency. ROE is a closely watched number among informed equity investors. It is linked to equity prices through the demand-supply framework. Corporate stock buyback programs when prices are low also improve ROE. In other words, both are connected with possible bidirectional causal flows.

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ROE is a dynamic financial ratio being time-variant to changes in macroeconomic conditions and policies, and firm-specific financial factors. The changes in macroeconomic conditions and policies are reflected in inflation, interest rate, the money supply, and the size of annual budget deficit relative to GDP.

The unprecedented size of recent U.S. budget deficits in 2008-2011 raises the question of the relation between budget deficits and stock prices. Economic theories cannot clearly explain this relationship. The effects of rising deficits due to income tax cuts or federal spending increases (or both) on stock prices primarily depend on the state of the economy and how the deficits are financed. To explain, income tax increases reduce disposable income and thus aggregate demand. In turn, this would reduce corporate earnings from sales with a negative impact on stock prices. Financing the deficit by federal borrowing raises interest rates that in turn reduce stock prices. Partial monetization of deficits by accommodative monetary easing lowers interest rates without risk of increasing inflation, if the economy is at less-than-full employment. This would help lift stock prices. In another vein, if the economy is at full employment, monetary easing will raise the fear of a future resurgence of inflation that will have a negative impact on the stock market as rational investors will reshuffle their portfolios by reallocating funds from financial assets to real assets. Thus, the net effects of budget deficits on stock prices and hence on ROE are uncertain. The disaggregation of the total budget deficit into structural and cyclical components may further complicate the analysis.

The valuation of stocks depends on expected current and future cash flows, the risks inherent in those flows, and rates at which those flows are discounted. Stock prices are influenced by changes in economic activity, interest rates, and inflation, among other macroeconomic fundamentals.

The Efficient Market Hypothesis in its weak-form claims that budget deficits have little effect on future stock prices as the past deficits are already incorporated in the current stock prices (Elton, et al., 2014).

The wedge between labor productivity and compensation has been another important source of U.S. corporate profits. Between 1973 and 2011, labor productivity rose 80.4 percent but the real median hourly wage (the largest component of compensation) only increased 4.0 percent. Thus, the labor productivity-compensation gap is likely to boost ROE and the stock market. Compensation is the main determinant of aggregate demand (AD) and labor productivity is the main driver of aggregate supply (AS). When real compensation lags behind labor productivity, AD falls short of AS calling for exogenous interventions in the forms of monetary easing, and higher budget deficits to stimulate private investment and consumption.

In the final analysis, the overall ROE is tied to the budget deficit and the labor productivity-compensation gap. As the budget deficit affects AD more than AS and the other variables influence AS more than AD, the net effects of both variables on ROE need to be studied simultaneously. Thus, the objective of this paper is to investigate the dynamic effects of the US budget deficit relative to GDP and the labor productivity-compensation gap on ROE primarily within the standard cointegration framework. Macroeconomic and financial variables usually have time-dependent variances without mean reversions. So, they are likely to be nonstationary. This methodology is appropriate for such variables in order to draw correct inferences without the problem of spurious correlation that leads to misleading conclusions for the OLS estimates of regressions with nonstationary variables (Granger and Newbold, 1974). The remainder of the paper is structured as follows. Section II provides a brief review of the related literature. Section III outlines the empirical methodology. Section IV reports empirical results. Section V offers conclusions.

BRIEF REVIEW OF RELATED LITERATURE

Financial ratio analysis assists investors in decision making regarding investments, and provides the basis for forecasting a firm's future performance (Ohlson, 1980). Financial research indicates that the firm characteristics such as growth, company size and efficiency, can be used to forecast the future stock price. Johnson and Soenen (2003) showed that large and profitable companies with greater level of advertising expenditure had better performance in terms of growth, size and efficiency measurements. Hobarth and Lukas (2006) investigated the correlation between the financial indicators and company performance, using seventeen financial indicators and three measures of firm performance: stock market value, dividend per share, and return on investment. price. Daniati and Suhairi (2006) indicated that cash flows from investing activities, company size and gross profit margin have a significant effect on the expected return of equity shares.

They found that companies with lower book to market ratio, more efficient working capital management, lower debt-equity ratio, less total assets, and greater earnings before net interest and tax (EBIT) margin can provide better market performance as measured by changes in stock

Tobin (1969), in his general equilibrium analysis of the financial sector, highlighted the role of stock returns as the linkage between the real and the financial sectors of the economy and showed how both money growth and budget deficits can have an important impact on stock returns. In this connection, theoretical discussions/models are also put forth by Blanchard (1981). It is well-known, after all, that government actions (or fiscal decisions) are likely to influence future monetary policy actions (Thorbecke, 1997; and Patelis, 1997).

Based on theory and empirical evidence, the expected directional impact of the budget deficit on stock returns should be negative. Government budget deficits exert upward pressure on the nominal interest rate or the discount rate, as applied to the firm. This, in turn, lowers expected

returns as the risk premium increases (Geske and Roll, 1983). Geske and Roll also note that increases in risk premia, due to federal deficits, expose investors to uncertainty surrounding the behavior of the Federal Reserve.

Several studies have focused on the relationship between fiscal policy (budget deficits) and stock market behavior. These studies examined primarily stock market efficiency with respect to fiscal actions (e.g., Rogalski and Vinso, 1977; Darrat, 1988; Darrat and Brocato, 1994; and Lee, 1997). Although the theoretical motivation on the effects of fiscal policy on the stock market (or asset prices) was laid out more than thirty years ago (e.g., Tobin, 1969; Blanchard, 1981), the empirical research on the issue has been lagging, both in the U.S.A and other countries (Darrat, 1988; and Ali and Hasan, 2003). Furthermore, the Ricardian equivalence states that increased government borrowing may have no impact on consumer spending because consumers predict tax cuts or higher spending will lead to future tax increases to pay back the debt. This is related to the Income Life Cycle hypothesis and the desire of consumers to smooth consumption over the course of their life (Barro, 1974). Subsequent investigations, however, have produced mixed results. Some studies support the proposition (e.g., Evans, 1987a, b; and Boothe and Ried, 1989), but others (e.g., Frenkel and Razin, 1986; and Zahid, 1988) do not.

Conventional analysis suggests that sustained budget deficits have severe effects on interest rates, national saving and the external account (Gale and Orszag, 2003, 2004; Engen and Hubbard, 2005). Thus, going beyond the traditional analysis, large future deficits entail additional risks to the economy which include a loss in domestic and foreign investor confidence and adverse effects on the exchange rate.

Specifically, a loss in investor and business confidence would cause a shift of portfolios away from home-currency assets into foreign-currency assets, thereby placing a downward pressure on the domestic currency and an upward pressure on the interest rate, which would limit the ability of the country to finance its liabilities and increase the country's exposure to exchange rate fluctuations. This situation, in turn, could undermine capital spending and ignite a drop in asset prices which would further restrain real economic activity.

In contrast, higher government deficits may also encourage higher money growth, resulting in an 'accommodative' behavior from the Federal Reserve or a decline in interest rates. Empirical research has produced mixed results. Specifically, Allen and Smith (1983) and Barnhart and Darrat (1989) report a negative relationship between federal deficits and money growth, while DeLeeuw and Holloway (1985) and Hoelscher (1986) provide evidence of a positive linkage between the two. Therefore, this is still an issue to be further established empirically.

Additionally, the effects of money growth on stock returns can be approached from two theoretical perspectives, namely, the efficient market approach (Cooper, 1974; and Rozeff, 1974) and the general equilibrium portfolio approach. The first approach simply argues that all past information incorporated in the money supply data is reflected in current stock returns and so

money supply changes should have no impact on stock returns (except, perhaps, a contemporaneous effect). The second perspective suggests that investors attempt to hold an equilibrium position among all assets, including money and equities. An exogenous shock that increases the money supply would temporarily disturb this equilibrium until investors substitute money for other assets. So, equities respond to a monetary disturbance with a lag and that lag could, theoretically, be linked to an interest-rate effect, a corporate-earnings effect, a risk-premium effect and so on (Hamburger and Kochin, 1971).

The conventional wisdom about the role of stocks is that they provide a hedge against inflation or that the Fisher hypothesis, that the nominal equity returns should be positively related to inflation, holds. However, evidence provided by Fama and Schwert (1977), Geske and Roll (1983), and McCarthy et al., (1990) suggests a negative relationship between stock returns and inflation. A re-examination of the issue by James et al., (1985), Wei and Wong (1992), and Lee (1992) found support for this hypothesis, while Park (1997), Siklos and Kwok (1999) and Laopodis (2006) found evidence to the contrary. Thus, this issue is still unresolved.

The widening labor productivity-compensation gap also contributes to surges in ROE and stock prices. Rising labor productivity boosts aggregate supply (AS). But real compensation gains lag behind the productivity gain. As a result, profits rise sharply, causing an upsurge in the demand for company shares raising their prices (Batra, 1999 and 2003). Using quarterly US data for the period of 1970-2000, Rashed and Samanta (2005) demonstrated a strong positive relationship between the labor productivity-compensation gap and the stock price within a macroeconomic framework suggested by Batra (1999).

EMPIRICAL METHODOLOGY

The estimating base equation is specified as follows:

$$(1)\ ROE_t = \alpha + \beta_1 BDG_t + \beta_2 PRC_t + e_t$$

Where, *ROE* = Return on equity, *BDG* = Actual US budget deficit as ratio of GDP, and *PCR* = Labor productivity-compensation gap (productivity/compensation). Prior to testing for cointegration, we examine the time series properties of the variables involved. To test for unit root (nonstationarity) in the variables, we employ the efficient modified Dickey-Fuller(DF-GLS) test and the modified Phillips-Perron(Ng-Perron) test as found in Elliot et al., 1996 and Ng and Perron, 2001. We also use the counterpart KPSS (Kwiatkowski, et al, 1992) test for no unit root (stationarity) instead of the standard ADF and PP tests. It is important to examine the time series properties of variables since an application of the Ordinary Least Squares (OLS) to estimate a model with nonstationary time series data results in the phenomenon of spurious regression (Granger and Newbold, 1974) invaliditating the inferences through the standard t-test and joint F-test (Phillips, 1986). To be cointegrated, variables must possess the same order of integration, i.e., each variable must become stationary on first-order differencing depicting I(1) behavior.

Second, we use the cointegration procedure developed in Johansen (1988, 1992, 1995) and Johansen and Juselius (1990) because it allows interactions in the determination of the relevant macroeconomic variables and is independent of the choice of the endogenous variable. It also allows explicit hypothesis testing of parameter estimates and rank restrictions using likelihood ratio tests. The empirical exposition of the Johansen-Juselius methodology is:

$$(2)\ \Delta V_t = \tau + \Omega V_{t-1} + \sum_{j=1}^{k-1} \Omega_j V_{t-j} + m_t$$

where, V_t denotes a vector of *SPR, BDG and PRC*, and $\Omega = \alpha\beta'$. Here, α is the speed of adjustment matrix and β is the cointegration matrix. Equation (2) is subject to the condition that Ω is a less-than-full rank matrix, i.e., r < n. This procedure applies the maximum eigenvalue test (λ_{max}) and trace test (λ_{trace}) for null hypotheses on r. Both tests have their trade-offs. The λ_{max} test is expected to offer a more reliable inference as compared to the λ_{trace} test (Johansen and Juselius, 1990), while the λ_{trace} test is preferable to the λ_{max} test for higher testing power (L$\ddot{u}$tkepohl et al., 2001). However, the Johansen-Juselius test procedure is also not immune to supersensitivity to the selection of lag-lengths. The optimum lag-lengths are determined by the AIC (Akaike Information Criterion) developed in Akaike (1969).

Finally, on the evidence of a cointegrating relationship among the variables, we estimate the following Vector Error-Correction model developed in Engle and Granger (1987):

$$(3)\ \Delta ROE_t = \beta_1 e_{t-1} + \sum_{i=1}^{k} \phi_i \Delta SPR_{t-i} + \sum_{j=1}^{k} \delta_j \Delta BDG_{t-j} + \sum_{j=1}^{k} \psi_j \Delta PRC_{t-j} + u_t$$

Equation (3) corresponds to the original equation (1). Here, e_{t-1} is the error-correction term of equation (3). If β_1 is negative and statistically significant in terms of the associated t-value, there will be long-run causal flows to the dependent variable from the relevant explanatory variables. If the δ_j's, ϕ_i's, and ψ_j's do not add up to zero, there are short-run interactive feedback relationships in equation (3).

For further empirical support, we implement the Dynamic Ordinary Least Squares (DOLS) and Fully Modified Least Squares (FMOLS). To gain additional insights, we invoke Variance Decomposition and Impulse Response Analyses. Dynamic OLS (DOLS) is attributed to Saikkonen (1991), and Stock and Watson (1993) as a simple approach to constructing an asymptotically efficient estimator eliminating the feedback in the cointegrating system. DOLS technically augments the cointegrating regression with lags and leads resulting in orthogonalizing the error term of the cointegrating regression to the entire history of the stochastic regressor innovations. Fully Modified Ordinary Least Squares (FMOLS) is attributed to Phillips and Hansen (1990) and provides optimal estimates of the cointegrating regression. FMOLS modified least squares to explicate serial correlation effects and account for the endogeneity in the regressors that arise from the existence of a cointegrating relationship.

The time profile of the causal impacts of unexpected shocks or innovations to specific variables in the model are usually summarized with impulse response functions within the cointegration framework for business cycle analyses (Greene, 2007 and Watson, 1994). A historical variance decomposition of variables is also useful to assessing the driving forces of cyclical fluctuations in VECM-form (Gali, 1999; and King et al., 1991).

Annual data are employed from 1976 through 2011. Data sources include the New York Stock Exchange, Standard & Poor's and Nasdaq Stock Market for ROE; the U.S. Department of Commerce for Budget Deficit and GDP; and the U.S. Department of Labor and Bureau of Statistics for labor productivity and the hourly compensation.

EMPIRICAL RESULTS

Table 1 shows the standard data descriptors:

TABLE 1: Descriptive Statistics

	ROE	BDG	PRC
Mean	12.64390	-22.14089	0.885899
Median	13.60000	-19.15199	0.880307
Maximum	17.60000	21.06211	1.077471
Minimum	2.000000	-111.2081	0.756530
Std. Dev.	3.855454	26.72608	0.091950
Skewness	-1.027146	-1.818453	0.331955
Kurtosis	3.669365	6.912403	1.920171
Jarque-Bera	7.974780	48.74556	2.744960
Probability	0.018548	0.000000	0.253478
Sum	518.4000	-907.7763	36.32187
Sum Sq. Dev.	594.5810	28571.34	0.338195
Observations	41	41	41

ROE = Rate of Return on Equity, BDG = Budget Deficit of the Federal Government and PRC = Labor productivity and Compensation gap

In terms of mean-to-median ratios and the Jarque-Bera statistic, the distributions of ROE, the budget deficit relative to GDP and the labor productivity-compensation gap reveal near-normality. Additionally, the distributions of ROE and the budget deficit relative to GDP (BDG) are slightly skewed to the left. The Kurtosis value reveals excess peakedness for the budget deficit relative to GDP.

Table 2 provides the pairwise simple correlation coefficients:

TABLE 2: Correlation Matrix

	ROE	**BDG**	**PRC**
ROE	1.000000	0.056361	0.103636
BDG	0.056361	1.000000	-0.472843
PRC	0.103636	-0.472843	1.000000

Table 2 shows that ROE and the budget deficit have low positive correlation while the correlation between ROE and the labor productivity-compensation gap is marginally positive. Again, the interaction between the budget deficit and the labor productivity-compensation gap is moderately negative.

Third, we examine time series property of nonstationarity/stationarity of each variable by applying the DF-GLS, the Ng-Perron and the KPSS tests. Their calculated values are shown in Table 3.

TABLE 3: Modified Dicky-Fuller, Ng-Perron, and KPSS Tests*

SERIES	**LEVEL**			**1ST DIFFERENCE**		
	DF-GLS	**Ng-PERRON**	**KPSS**	**DF-GLS**	**Ng-PERRON**	**KPSS**
ROE	-0.573	-4.2794	0.078	-5.519	-3.09606	0.2478
BDG	-1.2489	1.32206	0.4147	-5.2626	-3.0773	0.2796
PRC	1.114	1.73602	0.7958	-10.6044	-3.5964	0.3000

*****The modified Dickley-Fuller (DF-GLS) critical values are -2.653, -1.954 and -1.609 a 1%, 5% and 10% levels of significance respectively.The modified Phillips-Perron (Ng-Perron) critical values are -13.80, -8.10 and -5.70 at 1%, 5% and 10% level of significance respectively.The KPSS critical values are 0.739, 0.463 and 0.347 at 1%, 5% and 10% level of significance respectively.

As observed in Table 3, the DF-GLS and the Ng-Perron tests confirm nonstationarity in each variable uniformly at the 5 percent level of significance since their respective calculated values are less than the critical values. The counterpart (KPSS) test supports this conclusion even at the 1 percent level of significance by rejecting the null hypothesis of no unit root. All the variables in levels become stationary on first-differencing depicting I(1) behavior.

Fourth, given the results, we apply the Johansen-Juselius procedure for cointegration involving the λ_{trace} and the λ_{max} tests. We show the results in Table 4.

TABLE 4: JOHANSEN-JUSELIUS Multivariate Cointegration Test Results

Series: ROE BDG PRC
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.425702	35.87975	24.27596	0.0011
At most 1 *	0.346031	15.91389	12.32090	0.0120
At most 2	0.017207	0.624860	4.129906	0.4901

The Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.425702	19.96586	17.79730	0.0232
At most 1 *	0.346031	15.28903	11.22480	0.0092
At most 2	0.017207	0.624860	4.129906	0.4901

The Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 4 shows that both the λ_{trace} and the λ_{max} tests clearly reject the null hypothesis of no cointegration at the 5 percent level of significance indicating the existence of one cointegrating equation. In other words, there is evidence of convergence among the variables toward a long-run equilibrium.

Finally, given evidence of a cointegrating relationship among the variables, the Vector Error-Correction model (3) is estimated to test for long-run causal flows with convergence and short-run dynamic interactive feedback relationship among the variables. The estimates are reported in equation (3'):

$$\Delta ROE_t = 2.0727 - 1.0714\hat{e}_{t-1} + 0.6582\,\Delta ROE_{t-1} + 0.3072\,\Delta ROE_{t-2} - 0.5281\,\Delta BDG_{t-1}$$
(2.4168)*(-3.9181)* (2.8197)* (1.3181) (-1.6318)**

$$- 0.0528\,\Delta BDG_{t-2} + 32.5456\,\Delta PRC_{t-1} + 65.7592\,\Delta PRC_{t-2} \quad (3')$$
(-1.4086)*** (1.6266)** (2.5034)*

$\hat{R}^2$ = 0.5416, F = 4.1810, AIC = 5.0579

The associated t-values are reported within parentheses with *= significant at the 1 percent level, **= significant at the 5 percent level and ***= significant at the 10 percent level.

The coefficient of the error-correction term ($\hat{e}_{t-1}$) has the expected negative sign for a long-run converging causal flow from the independent variables to the dependent variable. The associated t-value is statistically significant while the numerical coefficient of the error-correction term indicates moderate speed of adjustment toward long-run equilibrium. The coefficients of lagged changes in ROE reveal its strong self-reinforcement. The lagged coefficients of the explanatory variables reveal short-run interactive net positive feedback effects with moderately significant t-values. $\bar{R}^2$ implies that about 54 percent of the current change in ROE is explained by the variables included in equation (3'). The F- test statistic also seems to be moderately significant. The estimates of Dynamic OLS (DOLS) and Fully Modified Ordinary Least Squares (FMOLS) in Appendix-B (1 & 2) support the above findings. Appendix-C shows that the variances of all the variables generally decay over time. Appendix-D indicates that ROE responds more to a shock to the budget deficit relative to GDP than to the labor productivity-compensation gap (also, Figures 1 and 2). Presumably, this is partly due to the widening budget deficit relative to GDP and shrinking labor productivity-compensation gap in recent years. However, the current official measure of labor productivity (economic output per hour worked) does not account for productivity enhancements from technology innovations.

CONCLUSIONS

To sum up, all three variables are nonstationary with I(1) behavior. They are cointegrated in levels. There is evidence of moderately strong long-run convergence and causal flows with short-run net positive interactive feedbacks. In the short run, the effects of the budget deficit and the labor productivity-compensation gap on ROE are seemingly significant. DOLS and FMOLS estimates also support the above findings. Variance Decomposition analysis shows that the variance of each variable decays over time. With respect to Impulse Response analysis, the budget deficit relative to GDP has a stronger effect on ROE than the labor productivity-compensation gap.

In light of the above, the issue of controlling the yawning budget deficit should receive greater policy attention at least in the short run than the labor productivity-compensation gap to improve ROE of nonfarm and nonfinancial large business entities. However, rising income inequality resulting from surging labor productivity-compensation gap ought to call for appropriate public policy attention.

REFERENCES

Akaike, H. 1969." Fitting Autoregression for Prediction." *Annals of the Institute of Statistical Mathematics,* 21: 243-247.

Allen, S. D. and Smith, M.D. 1983. "Government Borrowing and Monetary Accommodation.", *Journal of Monetary Economics,* 12: 605-616.

Ali, S.M. and Hasan, M.A. 2003. "Is the Canadian Stock Market Efficient with Respect to Fiscal Policy? Some Vector Autoregression Results." *Journal of Economics and Business,* 45: 45-59.

Barnhart, S.W. and Darrat, A.F. 1989. "Federal Deficits and Money Growth in the United States: a Vector Autoregressive Analysis." *Journal of Banking and Finance,* 13: 137-149.

Barro, R.J. 1974. Are Government Bonds Net Wealth?" *Journal of Political Economy,* 82: 1095-1117.

Batra, R. 1999. The Crash of the Millennium: Surviving the Inflationary Depression, *New York: Harmony Books*.

Batra, R. 2003. Common Sense Macroeconomics, *Richardson: Liberty Press*.

Blanchard, Olivier, J. 1981. "Output, the Stock Market and Interest Rates." *American Economic Review*, 71: 132-143.

Boothe, P.M., and Reid, B.G. 1989. "Asset Returns and Government Deficits in a Small Open Economy: Empirical Evidence from Canada." *Journal of Monetary Economics,* 23: 65-77.

Cooper, R.B.L. 1974. "Efficient Capital Markets and the Quantity Theory of Money." *Journal of Finance*, 29: 383-403.

Daniati, N. and Suhairi, N. 2006. "Influence of the Information Content of the Component Cash Flows, Gross Profit, and the Size of the Expected Return Stock Companies (survey on textile and automotive industries listed on the JSE)". *Padang: National Symposium on Accounting 9*.

Darrat, A.F. 1988. "On Fiscal Policy and the Stock Market." *Journal of Money*, *Credit and Banking*, 20: 353-363.

Darrat, A.F., and Brocato, J. 1994. “Stock Market Efficiency and the Federal Budget Deficit: Another Anomaly.” *Financial Review*, 29: 49-75.

DeLeeuw, F. and Holloway, T.M. 1985. “The Measurement and Significance of the Cyclicaly-Adjusted Federal Budget and Debt.” *Journal of Money, Credit and Banking,* 17: 232-242.

Elliot, G., Rothenberg, T.J. and Stock, J.H. 1996. “Efficient Test for an Autoregressive Unit Root.” *Econometrica*, 64: 813-836.

Elton, Edwin J., Gruber, Martin J., Brown, Stephen J. and Goetzmann, William J. 2014. *Modern Portfolio Theory and Investment Analysis*, 9th edition, John Wiley and Sons, Inc., New Jersey.

Engle, R.F. and Granger, C.W.J. 1987. “Cointegration and Error Correction: Representation, Estimation and Testing.” *Econometrica*, 55: 251-276.

Engen, E., and Hubbard, R.G. 2005. “Federal Government Debt and Interest Rates.” *National Bureau of Economic Research Macroeconomics Annual*.

Evans, P. 1987a. “Interest Rates and Expected Future Budget Deficits in the United States.”, *Journal of Political Economy*, 95: 34-58.

Evans, P., 1987b “Do Budget Deficits Raise Nominal Interest Rate? Evidence from Six Countries.” *Journal of Monetary Economics,* 95: 281-300.

Fama, E.F., and Schwert, G.W. 1977. “Asset Returns and Inflation.” *Journal of Financial Economics*, 5: 115-146.

Frenkel, J.A. and Razin, A. 1986. “The International Transmission and Effects of Fiscal Policies.” *American Economic Review, Papers and Proceedings,* 76: 33

Gale, William G. and Orszag, Peter R. 2003. “The Economic Effects of Long-Term Fiscal Discipline.” *Urban-Brookings Tax Policy Center Discussion Paper, No.8, April.*

Gale, William G. and Orszag, Peter R. 2004. “Budget Deficits, National Saving, and Interest Rates.” *Brookings Papers on Economic Activity 2*: 101-187.

Gali, J. 1999. “Technology, Employment and Business Cycle: Do Technology Shocks Explain Aggregate Fluctuations?“ *American Economic Review*, 89: 249-271.

Geske, R., and Roll, R. 1983. “The Fiscal and Monetary Linkage between Stock Returns and Inflation.” *Journal of Finance,* 38: 7-33.

Granger, C.W.J. & Newbold, P. 1974. “Spurious Regressions in Econometrics.” *Journal of Econometrics*, 2: 111-120.

Greene, William H. (2007). *Econometric Analysis, 6th edition, Pearson*.

Hamburger, J. and Kochin, L. 1971. “Money and Stock Prices. The Channels of Influence.” *Journal of Finance,* 26: 1056-1066.

Hobarth, Mag and Lukas, L.C. 2006. “Modeling the Relationship between Financial Indicators and Company Performance – an Empirical Study for US. Listed Companies.” *France: Dissertation Vienna University of Austria.*

Hoelscher, G.P. 1986. “New Evidence on Deficits and Interest Rates.” *Journal of Money, Credit and Banking*, 18: 1-17.

James, C., Koreisha, S. and Partch, M. 1985. “A VARMA Analysis of the Causal Relations among Stock Returns, Real Output, and Nominal Interest Rates.” *Journal of Finance,* 40:1375-1384.

Johansen, S. 1988. “Statistical Analysis of Cointegration Vectors.” *Journal of Economic Dynamics and Control*, 12: 231-254.

Johansen, S. 1992. “Testing Structural Hypothesis in Multivariate Cointegration Analysis of the PPP and the VIP for U.K” *Journal of Econometrics,* 53: 211-244.

Johansen S. 1995 *Likelihood-Based Inference in Cointegrated Vector Autoregressive Models.*, *Oxford: Oxford University Press*.

Johansen, S., and Juselius, K. 1990. “Maximum Likelihood Estimation and Inference on Cointegration with Applications to the Demand for Money.” *Oxford Bulletin of Economics and Statistics*, 51: 169-210.

Johnson, R. and Soenen, Luc. 2003. “Indicator of Successful Companies.” *European Management Journal*, 21: 364-369.

King, R., Plosser, C., Stock, J. and Watson, M.W. 1991. “Stochastic Trends and Economic Fluctuations.” *American Economic Review*, 81: 819-840.

Kwiatkowski, D., Phillips, P.C.B., Schmidt, P. and Shin, Y. 1992. "Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root." *Journal of Econometrics,* 54: 159-178.

Laopodis, Nikiforos T. 2006. "Dynamic Linkages among the Stock Market, Inflation, Monetary Policy and Real Activity." *Financial Review,* 41: 513-545.

Lee, Bong-Soo. 1992. "Causal Relations among Stock Returns, Interest Rates, Inflation, and Real Activity." *Journal of Finance,* 42:1591-1603.

Lee, Unro. 1997. "Stock Market and Macroeconomic Policies: New Evidence from Pacific Basin Countries." *Multinational Finance Journal,* 1: 273-289.

Lütkepohl, H., Saikkonen, P. and Trenkler, C. 2001. "Maximum Eigen Value versus Trace Tests for the Cointegrating Rank of a VAR Process." *Econometrics Journal,* 4: 287-310.

McCarthy, J., Najand, M. and Seifert, B. 1990. "Empirical Tests of the Proxy Hypothesis." *Financial Review*, 25: 251-264.

Ng, S. and Perron, P. 2001. "Lag Length Selection and the Construction of Unit Root Tests with Good Size and Power." *Econometrica,* 64: 813-836.

Ohlson, J.A. 1980. "Financial Ratios and the Probabilistic Prediction of Bankruptcy." *Journal of Accounting Research*, 18: 109-131.

Park, Sangkyun. 1997. "Rationality of Negative Stock-Price Responses to Strong Economic Activity." *Financial Analysts Journal*, 53: 52-56.

Patelis, A.D. 1997. "Stock Return Predictability and the Role of Monetary Policy." *Journal of Finance*, 52: 1951-1972.

Phillips, P.C.B. 1986. "Understanding Spurious Regressions in Econometrics." *Journal of Econometrics,* 33: 311-340.

Phillips, P.C.B. and Hansen, B.E. 1990. "Statistical Inference in Instrumental Variables Regression with I(1) Processes." *Review of Economic Studies*, 57: 99-125.

Rashed, J.A. and Samanta, S.K. 2005. "The Productivity-Compensation Gap and the Recent Stock Price Increase: an Analysis." *International Review of Economics and Finance,* 14: 169-180.

Rogalski, R., and Vinso, J. 1977. “Stock Returns, Money Supply and the Direction of Causality.” *Journal of Finance,* 32: 1017-1030.

Rozeff, M.S. 1974. “Money and Stock Prices.” *Journal of Financial Economics,* 1: 243-302.

Saikkonen, P. (1991). “Asymptotically Efficient Estimation of Cointegrating Regression.” *Econometric Theory*, 7: 1-21.

Siklos, P. and Kwok, B. 1999. “Stock Returns and Inflation: A New Test for Competing Hypothesis.” *Applied Economics*, 9: 567-581.

Stock, J.H. and Watson, M.W. 1993. “A Simple Estimator of Cointegrating Vectors in Higher Order Integrated Systems.” *Econometrica*, 61: 783-820.

Thorbecke, W. 1997. “On Stock Market Returns and Monetary Policy.” *Journal of Finance*, 52: 635-654.

Tobin, J. 1969. “A General Equilibrium Approach to Monetary Theory.” *Journal of Money, Credit and Banking*, 1: 15-29.

Watson, M.W. 1994. “Vector Autoregressions and Cointegrations.” *Handbook of Econometrics (eds. Engle, R.F. and McFadden, D.L.), IV, Elsevier Science B.V.*

Wei, K.C.J. and Wong, K. F. 1992. “Tests of Inflation and Industry Portfolio Stock Returns.” *Journal of Economics and Business*, 44:77-94.

Zahid, K. 1988. “Government Budget Deficits and Interest Rates: the Evidence since 1971,Using Alternative Deficit Measures.” *Southern Economic Journal*, 54: 725-731.

APPENDIX-A: DuPont Calculations

$$\text{ROA} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}}$$
$$= \text{Net Profit Margin} \times \text{Asset Turnover}$$

Three-Step Calculation:

$$\text{ROE} = \text{ROA} \times \frac{\text{Assets}}{\text{Equity}}$$
$$= \text{Net Profit margin} \times \text{Asset Turnover} \times \text{Balance Sheet Leverage}$$

Five-Step Calculation:

$$\text{ROE} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}} \times \frac{\text{EBIT}-\text{Interest Exp}}{\text{EBIT}}$$
$$\times [1 - \text{Tax Expense} \div (\text{EBIT} - \text{Interest Expense})]$$
$$= \text{Net Profit Margin} \times \text{Asset Turnover} \times \text{Balance Sheet Leverage} \times \text{Interest Burden} \times \text{Tax Efficiency}$$

Here, EBIT = Earning Before Interest and Taxes

To improve ROE, the followings need to be addressed (www.equitymaster.com):

(1) Increasing sales turnover – Sales turnover is the ratio of sales to the total assets employed by the company. It indicates how efficiently the company is using its assets to generate sales. A company can try to perform better on this metric by decreasing the amount of assets it uses to achieve a certain level of sales. The major assets that can be used more efficiently by a company are inventories, receivables and fixed assets.

(**2) Wider operating margins on sales –** For every dollar of sales that a company makes, there are many operating expenses that have to be deducted before it can arrive at its operating profits including: employee costs, raw material costs, and other general & administrative expenses. In times of inflation, companies can try to increase the prices of their products without hurting demand. But inflation causes an increase in its operating costs too. In such a situation, the only way a company can increase its margins is to increase its prices (sales) at a faster rate than the increase in its operating costs. This can be achieved only if the company possesses a competitive advantage such as being the lowest cost producer or having a strong brand.

(3) More leverage – This is one strategy a company might pursue if its ambitions to grow are higher than the pace of its internal accruals. Taking on more debt has the effect of enhancing the ROE of the company. But, at the same time, it exposes the company to certain external risks due to the fixed costs of the interest charged by the lender and the timely repayment obligations of the principal amount according to the preferences of the lender. Thus, in general, a company earning a certain level of ROE without any debt is much safer than a company earning that same level of ROE by employing large amounts of debt.

(4) Cheaper leverage – In times of inflation, interest rates tend to go up. The cost of debt goes up along with that. The more expensive cost of borrowing, the less it contributes to improving a company's ROE. In fact, if a company borrows at high rates that exceed the returns the company can generate using those funds, it can actually reduce the final ROE of the company.

(5) Lower taxes – Taxes can take a significant bite out of a company's profits and thus ROE. Thus, some companies in certain industries that are subject to lower taxes due to favorable government policies/incentives have a huge advantage over the others.

APPENDIX-B (1): Dynamic OLS Estimates

Dependent Variable: ROE
Method: Least Squares
Sample (adjusted): 1976-2011
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.048026	6.595905	0.007281	0.9942
ROE(-1)	0.562376	0.135132	4.161670	0.0002
BDG(-1)	-4.20E-06	1.93E-06	-2.177105	0.0361
PRC(-1)	4.196809	5.248705	0.799589	0.4292

R-squared	0.363117	Mean dependent var	12.71750
Adjusted R-squared	0.310043	S.D. dependent var	3.875292
S.E. of regression	3.218959	Akaike info criterion	5.270632
Sum squared resid	373.0210	Schwarz criterion	5.439520
Log likelihood	-101.4126	Hannan-Quinn criter.	5.331697
F-statistic	6.841763	Durbin-Watson stat	1.595675
Prob(F-statistic)	0.000914		

APPENDIX-B (2)

Dependent Variable: ROE
Method: Fully Modified Ordinary Least Squares (FMOLS)
Sample (adjusted): 1976-2011
Included observations: 39 after adjustments
Cointegrating equation deterministics: C
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth
= 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROE(-1)	0.607642	0.096305	6.309554	0.0000
BDG(-1)	-2.64E-06	1.37E-06	-1.930969	0.0616
PRC(-1)	0.799089	3.810999	0.209680	0.8351
C	3.816833	4.735084	0.806075	0.4256

R-squared	0.340066	Mean dependent var	12.77179
Adjusted R-squared	0.283501	S.D. dependent var	3.910509
S.E. of regression	3.310100	Sum squared resid	383.4867
Durbin-Watson stat	1.651840	Long-run variance	5.197956

APPENDIX-C: Variance Decomposition

Variance Decomposition of ROE:

Period	S.E.	ROE	BDG	PRC
1	2.631057	100.0000	0.000000	0.000000
2	3.153009	90.43474	1.730865	7.834393
3	3.711918	66.20541	9.920017	23.87457
4	4.223045	55.50733	11.42050	33.07217
5	4.747789	47.67071	22.08319	30.24610
6	5.955466	30.68676	40.88414	28.42909
7	6.548348	25.38480	46.43140	28.18380
8	6.804955	23.50748	49.12783	27.36470
9	6.940293	22.59998	50.59574	26.80428
10	6.981613	22.37621	51.11393	26.50986

Variance Decomposition of BDG:

Period	S.E.	ROE	BDG	PRC
1	190596.6	0.575952	99.42405	0.000000
2	290654.2	4.311077	95.59834	0.090583
3	345192.4	4.660652	95.27439	0.064957
4	386598.9	3.769223	96.11303	0.117751
5	400973.2	3.586907	96.11664	0.296457
6	430264.9	4.471292	95.26532	0.263387
7	475440.0	4.491045	93.54214	1.966820
8	528490.8	3.671304	92.88888	3.439815
9	580698.1	3.067388	92.43141	4.501198
10	601344.0	3.013369	91.54996	5.436670

Variance Decomposition of PRC:

Period	S.E.	ROE	BDG	PRC
1	0.029084	0.915270	2.887224	96.19751
2	0.029510	1.533670	3.653714	94.81262
3	0.030779	1.429821	5.848831	92.72135
4	0.037822	1.257887	29.89689	68.84522
5	0.039872	2.324289	29.76299	67.91272
6	0.041189	5.847453	27.89024	66.26231
7	0.042716	6.381392	31.34949	62.26912
8	0.043320	6.259997	30.51656	63.22345
9	0.044110	7.483158	30.67853	61.83831
10	0.044344	7.502360	30.36132	62.13632

Cholesky Ordering: ROE BDG PRC

APPENDIX-D: Impulse Response

Response of ROE: Period	ROE	BDG	PRC
1	2.631057	0.000000	0.000000
2	1.438080	-0.414817	0.882527
3	-0.362580	-1.093042	1.584508
4	-0.881609	-0.818493	1.615119
5	-0.920029	1.714974	0.959060
6	-0.371698	3.085892	-1.806983
7	0.037028	2.325849	-1.415043
8	0.021958	1.685122	-0.765784
9	0.013408	-1.273172	-0.488994
10	-0.144693	-0.737315	-0.103361

Response of BDG: Period	ROE	BDG	PRC
1	14464.67	190046.9	0.000000
2	58589.80	211290.1	-8747.842
3	43721.13	181012.4	936.5645
4	8938.958	173558.3	-9929.086
5	-11557.67	104338.8	17339.36
6	-50105.82	147738.8	3310.686
7	-43290.82	187304.6	-62914.71
8	-10116.43	219078.4	-71844.46
9	9460.645	228576.6	-74639.21
10	23520.98	139175.5	-66942.45

Response of PRC: Period	ROE	BDG	PRC
1	-0.002782	-0.004942	0.028526
2	-0.002369	0.002720	0.003461
3	-0.000435	-0.004857	0.007260
4	-0.002109	0.019294	0.010318
5	-0.004354	-0.006743	0.009736
6	-0.007890	6.85E-05	0.006671
7	-0.004152	0.009943	0.003475
8	-0.001018	-0.000810	0.007089
9	-0.005303	0.004921	0.004086
10	-0.001388	-0.000340	0.004320

Cholesky Ordering: ROE BDG PRC

Figure 1
Response of ROE to Cholesky
One S.D. Innovations

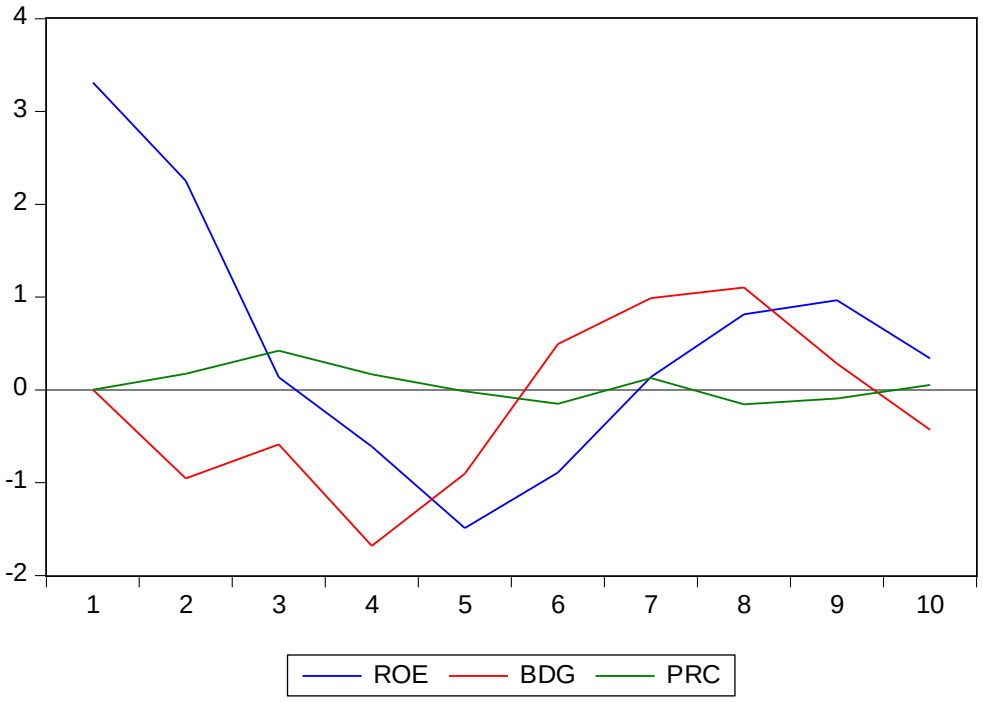
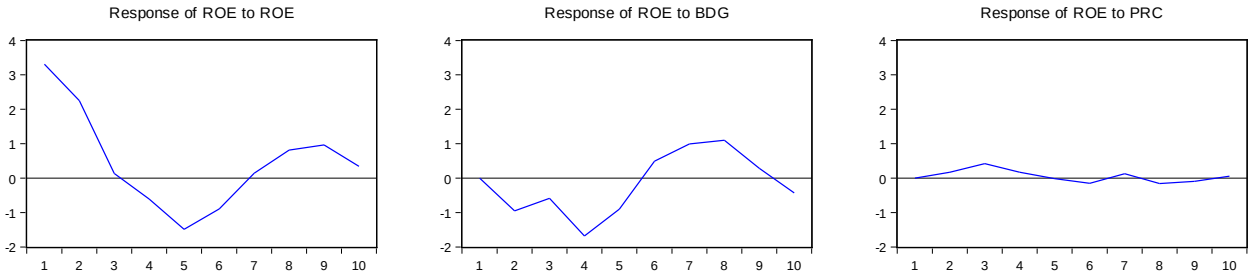


Figure 2
Response to Cholesky One S.D. Innovations



REFEREES

1. Paul Bauer
2. James Booker
3. Fan Chen
4. Kai Chen
5. Richard Dietz
6. Elia Kacapyr
7. Philip Sirianni
8. Jeffrey Wagner
9. Mark Zaparowski
10. Xu Zhang

The New York State Economics Association

68th Annual Conference
Siena College
October 9th and 10th, 2015

Schedule of Events

Friday, October 9, 2015

6:00pm	Reception, Desmond Hotel, Albany, New York
6:30pm	Welcome

Saturday October 10, 2015

7:30 am - 8:00 am	Registration and Continental Breakfast
8:00 am - 8:15 am	Welcome
8:15 am - 9:35 am	Concurrent Sessions: Group A
9:35 am - 9:50 am	Morning Break
9:50 am - 11:10 am	Concurrent Sessions: Group B
11:25 am - 12:40 pm	Luncheon and Keynote Address
NY FED	
12:50 pm - 2:10pm	Concurrent Sessions: Group C
2:10 pm - 2:25pm	Afternoon Break
2:25 pm - 3:45pm	Concurrent Sessions: Group D
4:00 pm - 5:00pm	Business Meeting (All Are Welcome)

Saturday, October 10, 2015

7:30-8:00 am REGISTRATION AND CONTINENTAL BREAKFAST
Maloney Great Room, Siena College

8:00-8:15 am WELCOME ADDRESS

8:15 - 9:35AM: Concurrent Sessions: Group A

Session 10 Health, Education and Welfare

8:15 to 9:35 am
Chair: John Polimeni (Albany College of Pharmacy and Health Sciences)

Title: The Impact of High Deductible Health Plans on Preventive Care Use
Authors: Daniel J. Wright (Albany College of Pharmacy and Health Sciences), daniel.wright@acphs.edu
Wendy M. Parker (Albany College of Pharmacy and Health Sciences), wendy.parker@acphs.edu
Patrick D. Meek (Albany College of Pharmacy and Health Sciences), patrick.meek@acphs.edu
John Polimeni (Albany College of Pharmacy and Health Sciences), john.polimeni@acphs.edu
Discussant: Raul Segura-Escano (CUNY Graduate Center), rsegura@gradcenter.cuny.edu

Title: The Impact of Terrorism on Stress and Substance Use: Evidence from the Boston Marathon Bombing
Authors: Raul Segura-Escano (CUNY Graduate Center), rsegura@gradcenter.cuny.edu
Michael F. Pesko (Weill Cornell Medical College, Cornell University), mip2037@med.cornell.edu
Discussant: Agustin Indaco (CUNY Graduate Center), aindaco@gradcenter.cuny.edu

Title: HIV-Specific Criminal Laws: Preventing HIV Transmission or Just a Disincentive for Testing?

Author: Agustin Indaco (CUNY Graduate Center), aindaco@gradcenter.cuny.edu
Discussant: Wendy Parker (Albany College of Pharmacy and Health Services), wendy.parker@acphs.edu

Title: Adolescent Peer Networks and Health: An Initial Look with Add Health Data
Author: Wendy Parker (Albany College of Pharmacy and Health Services), wendy.parker@acphs.edu
Discussant: John Polimeni (Albany College of Pharmacy and Health Sciences), john.polimeni@acphs.edu

Session 11 Financial Economics
8:15 to 9:35 am
Chair: Zhenzhen Sun (Siena College), zsun@siena.edu

Title: Implied volatility estimation via L1 trend filtering
Authors: Pablo Crespo (CUNY Graduate Center), pabloalejandrocrespo@gmail.com
Ta-Cheng Huang (Texas A&M University), tchaung5@gmail.com
Discussant: Florence F. P. Shu (SUNY Canton), shuf@canton.edu

Title: Institutional Spot and Futures Investment
Author: Florence F. P. Shu (SUNY Canton), shuf@canton.edu
Discussant: Balbinder Singh Gill (Vrije Universiteit Brussel), balbindersgill@gmail.com

Title: Cross-country evidence on the relation between capital structure variability and protection of minority shareholders from conflicts of interest with directors
Author: Balbinder Singh Gill (Vrije Universiteit Brussel), balbindersgill@gmail.com
Discussant: Zhenzhen Sun (Siena College), zsun@siena.edu

Title: Are Stocks Undervalued or Overvalued?
Authors: Zhenzhen Sun (Siena College), zsun@siena.edu
Lauren Smith (Siena College), le14smit@siena.edu
Discussant: Pablo Crespo (CUNY Graduate Center), pabloalejandrocrespo@gmail.com

Session 12 Law and Economics
8:15 to 9:35 am
Chair: Gwen Seaquist (Ithaca College School of Business), gseaquist@ithaca.edu

---

Title: Employed or Exploited? Financial and Legal Implications of the Uber Case
Authors: Gwen Seaquist (Ithaca College School of Business), gseaquist@ithaca.edu
Alka Bramhandkar (Ithaca College School of Business), abramhandkar@gmail.com
Marlene Barken (Ithaca College School of Business), mbarken@ithaca.edu
Discussant: Anthony Pappas (St. Johns University), anthonypappas1988@gmail.com

Title: Economic Consequences Stemming from Doctrine of Absolute Judicial Immunity
Author: Anthony Pappas (St. Johns University), anthonypappas1988@gmail.com
Discussant: Mark Gius (Quinnipiac University), mark.gius@quinnipiac.edu

Title: The Impact of the Death Penalty and Executions on State-Level Murder Rates: 1980-2011

Author: Mark Gius (Quinnipiac University), mark.gius@quinnipiac.edu
Discussant: Ruohan Wu (Alabama State University), rwu@alasu.edu

Title: How Do Firms Survive Crimes and Corruption, On and Off the Record? An Empirical Study in Global Developing Economies

Author: Ruohan Wu (Alabama State University), rwu@alasu.edu
Discussant: Gwen Seaquist (Ithaca College School of Business), gseaquist@ithaca.edu

Session 13 Labor and Demographic Economics
8:15 to 9:35 am
Chair: Richard Vogel (Farmingdale State College)

Title: Protecting the Welfare of Children and its Causal Effect on Mothers Labour Migration
Author: Bilesha B. Weeraratne (Institute of Policy Studies of Sri Lanka), bilesha@ips.lk
Discussant: Bhaswati (Bonu) Sengupta (Iona College), bsengupta@iona.edu

Title: Exploring the Gender Pay Gap in New York

Author: Bhaswati (Bonu) Sengupta (Iona College), bsengupta@iona.edu
Discussant: Richard Vogel (Farmingdale State College), richard.vogel@farmingdale.edu

Title: Does Spending on Athletics Impact Investment in Academics: The Case of Football Spending and Faculty Salaries

Authors: Richard Vogel (Farmingdale State College), richard.vogel@farmingdale.edu
Glenn Gerstner (St. Johns University), gerstneg@stjohns.edu
Darius Conger (Independent Scholar), dconger@ithaca.edu
Discussant: Jeffrey D. Burnette (Rochester Institute of Technology), jdbgse@rit.edu

Title: The Earnings Gap for Native American Males (2003-2007)
Author: Jeffrey D. Burnette (Rochester Institute of Technology), jdbgse@rit.edu
Discussant: Bilesha B. Weeraratne (Institute of Policy Studies of Sri Lanka), bilesha@ips.lk

Session 14 **Health, Education and Welfare**
8:15 to 9:35 am
Chair: Maria Sanmartin (Stony Brook University), mariaxsanmartin@hotmail.com

---

Title: Economic Evaluation of Integrated Care Combining Health Care and Social-Welfare Programs for the Elderly in Rural Areas

Author: Jinyoung Eom (Korea Rural Economic Institute), jeom@krei.re.kr
Discussant: Mir Nahid Mahmud (SUNY Albany), mnahid@albany.edu

Title: Effect of Child Disability on Parental Labor Market Outcomes
Author: Mir Nahid Mahmud (SUNY Albany), mnahid@albany.edu
Discussant: Maria Sanmartin (Stony Brook University), mariaxsanmartin@hotmail.com

Title: Medicaid Endogenous Eligible: Who are they and how much are they costing us?

Author: Maria Sanmartin (Stony Brook University), mariaxsanmartin@hotmail.com
Discussant: Jinyoung Eom (Korea Rural Economic Institute), jeom@krei.re.kr

Session 15 **Undergraduate Student Paper Contest: A**
9:50 to 11:10 am
Chair:

Title: Addiction Is Not Inevitable: An Application of the Neuroeconomic Drift Diffusion Model
Author: Jhoan Esteban Osorno
Discussant:

Title: Effects of Economic Growth on Religion
Author: Angiulina Magdalena
Discussant:

Title: Relative Economic (Im)mobility: Revisiting the Intergenerational Drag Hypothesis
Author: Prabsharn Singh Paul
Discussant:

Title: How Stable is the Error Correction Model Cointegrating WTI and Brent Crude Oil Prices
Author: Jennifer Rushlow
Discussant:

9:50 - 11:10AM: Concurrent Sessions: Group B

Session 20 **International Economics**
9:50 to 11:10 am
Chair: Tom Kopp (Siena College)

Title: The Effect of Legal Status on Immigrant Wages and Occupational Skills
Authors: Quinn Steigleder (Colgate University), qsteigleder@colgate.edu
Chad Sparber (Colgate University), csparber@colgate.edu
Discussant: Michael Malenbaum (Iona College), mmalenbaum@gradcenter.cuny.edu

Title: Enter the Dragon: Chinas Impact on Pass-Through to US Import Prices
Author: Michael Malenbaum (Iona College), mmalenbaum@gradcenter.cuny.edu
Discussant: Yang Li (Fordham University), yli52@fordham.edu

Title: The impact of Institutional risks, and exchange rate volatility on Chinas outward FDI
Author: Yang Li (Fordham University), yli52@fordham.edu
Discussant: Chad Sparber (Colgate University)

Title: Macroeconomic Volatility and Capital Flows among Advanced and Emerging Economies
Author: Luis Silva-Yanez (CUNY Graduate Center), lsilvayanez@gradcenter.cuny.edu
Discussant: Tom Kopp (Siena College)

Title: The Native-Born Occupational Skill Response to Immigration within Education and Experience Cells
Authors: Emily Gu (Colgate University), egu@colgate.edu
Chad Sparber (Colgate University), csparber@colgate.edu
Discussant: Luis Silva-Yanez (CUNY Graduate Center), lsilvayanez@gradcenter.cuny.edu

Session 21 **Financial Economics**
9:50 to 11:10 am
Chair: Jim Murtagh (Siena College), jmurtagh@siena.edu

Title: Risk Premia and Knightian Uncertainty in an Experimental Market Featuring a Long-Lived Asset

Author: John Griffin (Fordham University), john.knox.griffin@gmail.com
Discussant: Alex Chung (Norwich University), wchung@norwich.edu

Title: First-Day Stock Returns to Issuing Initial Corporate Bond and Seasoned Equity
Author: Alex Chung (Norwich University), wchung@norwich.edu
Discussant: Rick Proctor (Siena College), proctor@siena.edu

Title: Puzzles in the Chinese A-H Shares
Author: Zhaohui Zhang (LIU Post), zzhusa@gmail.com
Discussant: Jim Murtagh (Siena College), jmurtagh@siena.edu

Title: The Role of the Form of Managerial Compensation on Bank Performance
Authors: Rick Proctor (Siena College), proctor@siena.edu
Jim Murtagh (Siena College), jmurtagh@siena.edu
Discussant: Zhaohui Zhang (LIU Post), zzhusa@gmail.com

Session 22 Mathematical and Quantitative Methods
9:50 to 11:10 am
Chair: John J. Heim (SUNY Albany)

Title: Common Sense Economics
Author: Florence F. P. Shu (SUNY Canton), shuf@canton.edu
Discussant: John J. Heim (SUNY Albany), jheim@albany.edu

Title: Comparing Goodness of Fit of DSGE, VAR and Keynesian Econometric Models
Author: John J. Heim (SUNY Albany), jheim@albany.edu
Discussant: Marwan ElNasser (SUNY at Fredonia), elnasser@fredonia.edu

Title: Credit Flows and Open-Market Operations
Authors: Richard Robinson (SUNY at Fredonia), richard.robinson@fredonia.edu
Marwan ElNasser (SUNY at Fredonia), elnasser@fredonia.edu
Discussant: Huibin Chang (SUNY Buffalo), hc73@buffalo.edu

Title: The Effect of Flat-Fare Transit Pass: An Analysis Using the Relu Tran Computable General Equilibrium Model
Author: Huibin Chang (SUNY Buffalo), hc73@buffalo.edu
Discussant: Florence F. P. Shu (SUNY Canton), shuf@canton.edu

Session 23 Financial/International Economics
9:50 to 11:10 am
Chair: Zhenzhen Sun (Siena College), zsun@siena.edu

Title: Stock Return Differentials, Real Exchange Rate Fluctuations, and the EMU
Author: Evan Warshaw (CUNY Graduate Center), ewarshaw@gradcenter.cuny.edu
Discussant: Zhenzhen Sun (Siena College), zsun@siena.edu

Title: Dividend Announcement and Stock Price Change
Authors: Zhenzhen Sun (Siena College), zsun@siena.edu
Eric Beresheim (Siena College), 227bere@siena.edu
Discussant: James P. Stodder (Rensselaer Polytechnic Institute), stoddj@rpi.edu

Title: US-Russia Climatic Cooperation: Carbon Pricing, Arctic Shipping
Author: James P. Stodder (Rensselaer Polytechnic Institute), stoddj@rpi.edu
Discussant: Evan Warshaw (CUNY Graduate Center), ewarshaw@gradcenter.cuny.edu

Session 24 Undergraduate Student Paper Contest: B
9:50 to 11:10 am
Chair:

Title: Corporate Profits and Its Impact on Small Business: An Empirical Analysis
Author: Mankirat Singh
Discussant:

Title: An Economic Perspective on Water Quality Degradation from Non-Point Source Agricultural Runoff
Author: Maxmilan Schreck
Discussant:

Title: I am not an iconoclast. But freedom might not make us happy.
Author: Samuel Necrason
Discussant:

Title: The Fallen Fruit: Evaluating Structural Adjustment and the Jamaican Banana Industry
Author: David Buchanan
Discussant:

11:2 - 12:40 pm Luncheon and Keynote Address

12:50 - 2:10AM: Concurrent Sessions: Group C

Session 30 General Economics and Teaching
12:50 to 2:10 pm
Chair: Philip Sirianni (SUNY Oneonta), sirianp@oneonta.edu

Title: Reproducibility As A Pedagogical Strategy (TIER Without Tears)
Author: Michael O'Hara (Colgate University), mohara@colgate.edu
Discussant: Della L. Sue (Marist College), della.lee.sue@marist.edu

Title: So, how are we doing? Teaching Traditional Measures of an Untraditional Economy
Author: Della L. Sue (Marist College), della.lee.sue@marist.edu
Discussant: Philip Sirianni (SUNY Oneonta), sirianp@oneonta.edu

Title: On Teaching the Separation of Income and Substitution Effects of a Price Change: A Class Exercise for Microeconomics Students
Author: Philip Sirianni (SUNY Oneonta), sirianp@oneonta.edu
Discussant: Clair Smith (St. John Fisher College), csmith@sjfc.edu

Title: Student Note-Taking and Substantive Performance in Economics Principles Classes

Authors: Clair Smith (St. John Fisher College), csmith@sjfc.edu
Lauren Calimeris (St. John Fisher College), lcalimeris@sjfc.edu
Discussant: Samantha Stauch (Buffalo State College), samanthamstauch@gmail.com

Title: Colonial Historic Economics: Hamiltons Vision
Author: Samantha Stauch (Buffalo State College), samanthamstauch@gmail.com
Discussant: Michael O'Hara (Colgate University), mohara@colgate.edu

Session 31 Macroeconomics and Monetary
12:50 to 2:10 pm
Chair: Tom Kopp (Siena College)

Title: The Bubble, the Crisis and 21st Century Economics
Author: William T. Ganley (Buffalo State College), ganleywt@roadrunner.com
Discussant: Gunnar Poppe Yanez (CUNY Graduate Center)

Title: Subjective Mortality and Wealth Distribution
Authors: Gunnar Poppe Yanez (CUNY Graduate Center), gpoppeyanez@gradcenter.cuny.edu
Zhendong Zhao (CUNY Graduate Center), zzhao2@gradcenter.cuny.edu
Discussant: George Gonpu (Ramapo College of New Jersey), ggonpu@ramapo.edu

Title: On the Macroeconomic Determinants of the US-Liberian Dollar Exchange Rate Instability

Authors: George Gonpu (Ramapo College of New Jersey), ggonpu@ramapo.edu
Cristhian Vera (Ramapo College of New Jersey), cveraave@ramapo.edu
Discussant:

Title: What is the best policy mix to reduce the natural rate of unemployment?
Author: Robert Derrell (Manhattanville College), Robert.derrell@mville.edu
Discussant: William T. Ganley (Buffalo State College), ganleywt@roadrunner.com

Session 32 **The Economy and Gender Violence**
12:50 to 2:10 pm
Chair: Jeannette C. Mitchell (Rochester Institute of Technology)

Title: Monsters, Misogyny, and the Market: Nineteenth Century Fiction and Violence Against Women

Authors: Johanna Mitchell (Hartwick College), mitchellj@hartwick.edu
Katherine Hadden (University of Rochester), katherinehadden88@gmail.com
Discussant: Chaitali Chanda (Rochester Institute of Technology), cxc4223@mail.rit.edu

Title: The Economic Causes of Domestic Violence
Author: Chaitali Chanda (Rochester Institute of Technology), cxc4223@mail.rit.edu
Discussant: Katherine Hadden (University of Rochester), katherinehadden88@gmail.com

Title: The Violent Home: Women's Forced Participation in the Sexual Division of Labor from the Seventeenth Century to the Civil War

Author: Katherine Hadden (University of Rochester), katherinehadden88@gmail.com
Discussant: Jeannette C. Mitchell (Rochester Institute of Technology), jcmgsm@rid.edu

Title: Economic Ramifications of Gender Inequality
Author: Jeannette C. Mitchell (Rochester Institute of Technology), jcmgsm@rid.edu
Discussant: Johanna Mitchell (Hartwick College), mitchellj@hartwick.edu

Session 33 **Conflict and Natural Resource**
12:50 to 2:10 pm
Chair: Smita Ramnarain (Siena College), sramnarain@siena.edu

Title: The Gender Implications of Climate Change Adaptation in a Western Indian Pastoral Community

Authors: Smita Ramnarain (Siena College), sramnarain@siena.edu
Kalpana Venkat (Rutgers University), kalpanasa@gmail.com
Discussant: Lima Hossain (Ithaca College), lhossai1@ithaca.edu

Title: Price Elasticity of Demand for Water in the Town of Ithaca
Author: Lima Hossain (Ithaca College), lhossai1@ithaca.edu
Discussant: Dr. Joseph McCollum (Siena College), jmccollum@siena.edu

Title: The Potential for OECD Members to be Global Leaders in Environmental Sustainability
Authors: Matt Leggiero (Siena College), mh301egg@siena.edu
Dr. Joseph McCollum (Siena College), jmccollum@siena.edu
Discussant: Aniruddha Mitra (Bard College), amitra@bard.edu

Title: Internal Conflict and Economic Growth: The Case for a Closer Look
Author: Aniruddha Mitra (Bard College), amitra@bard.edu
Discussant: Smita Ramnarain (Siena College), sramnarain@siena.edu

Session 34 Microeconomics
12:50 to 2:10 pm
Chair: Ashley Provencher (Siena College), aprovencher@siena.edu

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Title: Save the Law of Supply and Demand
Author: M. Northrup Buechner (St. Johns University), buechnen@stjohns.edu
Discussant: Ashley Provencher (Siena College), aprovencher@siena.edu

Title: Policing with the intent to improve child welfare: Findings from a recent intervention

Author: Ashley Provencher (Siena College), aprovencher@siena.edu
Discussant: Raymond MacDermott (Virginia Military Institute), macdermottrj@vmi.edu

Title: Culture and Entrepreneurship
Authors: Raymond MacDermott (Virginia Military Institute), macdermottrj@vmi.edu
Dekuwmini Mornah (Virginia Military Institute), mornahd@vmi.edu
Discussant: Hyeon Park (Manhattan College), hyeon.park@manhattan.edu

Title: Reference Dependence and the Constrained Consumer
Author: Hyeon Park (Manhattan College), hyeon.park@manhattan.edu
Discussant: M. Northrup Buechner (St. Johns University), buechnen@stjohns.edu

Session 35 Macro and Finance
12:50 to 2:10 pm
Chair: Abeba Mussa (Farmingdale State College)

Title: A 50 Equation Econometric Model of the U.S. Economy
Author: John J. Heim (SUNY Albany), jheim@albany.edu
Discussant: Ossama Elhadary (CUNY Graduate Center), oelhadary@gradcenter.cuny.edu

Title: Financial Tools for the U.S. Real Sector: Quantitative Easing-Based Interest Rates Versus Social Discount Rates
Author: Chukwudi Ikwueze (Borough of Manhattan Community College), chuikwueze@aol.com
Discussant: John J. Heim (SUNY Albany), jheim@albany.edu

Title: Is There Discrimination in Mortgage Pricing?
Author: Abeba Mussa (Farmingdale State College), mussaa@farmingdale.edu
Discussant: Chukwudi Ikwueze (Borough of Manhattan Community College)

Title: Volatility and eBay Auctions
Author: Ossama Elhadary (CUNY Graduate Center), oelhadary@gradcenter.cuny.edu
Discussant: Abeba Mussa (Farmingdale State College), mussaa@farmingdale.edu

2:25 – 3:45 pm: Concurrent Sessions: Group D

Session 40 Public Economics
2:25 to 3:45 pm
Chair: Arindam Mandal (Siena College), amandal@siena.edu

Title: Does Negative Voting Affect Voter Turnout? Evidence from Indian Elections 469
Authors: Arindam Mandal (Siena College), amandal@siena.edu
Biswajit Mandal (Visva-Bharati University)
Discussant: Ben J. Niu (St. John Fisher College), bniu129@gmail.com

Title: Preferential Corporate Taxation and Profit Correlation Under a Bivariate Pareto Distribution

Author: Ben J. Niu (St. John Fisher College), bniu129@gmail.com
Discussant: Diane Coogan-Pushner (CUNY Queens College)

Title: Risk and Return of Industrial Development Bonds
Authors: Diane Coogan-Pushner (CUNY Queens College), diane.cooganpushner@qc.cuny.edu
Joshua Keller (New York University), Joshua.keller906@gmail.com
Discussant: Chiao-Han Lin (CUNY Graduate Center), melek0@gmail.com

Title: Workforce Structure Change After Employer Mandate: Full-Time vs. Part-Time Employment
Author: Chiao-Han Lin (CUNY Graduate Center), melek0@gmail.com
Discussant: Arindam Mandal (Siena College), amandal@siena.edu

Session 41 Labor and Demographic Economics
2:25 to 3:45 pm
Chair: Robert Jones (Skidmore College), rjones@skidmore.edu

Title: Changes in Non-employment Status and the Great Recession
Author: Robert Jones (Skidmore College), rjones@skidmore.edu
Discussant: Kpoti Kitissou (SUNY Oswego), kkitisso@gmail.com

Title: The impact of the HIV Epidemic on Womens Marriage Outcomes
Authors: Kpoti Kitissou (SUNY Oswego), kkitisso@gmail.com
Bong Joon Yoon (SUNY Binghamton), yoon@binghamton.edu
Discussant: Tavis Barr (Beijing Normal University), tavisbarr@gmail.com

Title: Work Hours and Measured Inequality in China
Authors: Tavis Barr (Beijing Normal University), tavisbarr@gmail.com
Hui Xu (Beijing Normal University), xuhui@bnu.edu.cn
Discussant: Robert Jones (Skidmore College), rjones@skidmore.edu

Title: The Technology of Economics
Author: Eryk Wdowiak (CUNY Queens College), eric@doviak.net
Discussant: TBA

Session 42 Urban, Rural, Regional Econ
2:25 to 3:45 pm
Chair: Jeffrey Wagner (Rochester Institute of Technology), mjwgse@rid.edu

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Title: A Mortgage Product that Improves Labor Mobility while Reducing Systemic Risk
Author: Robert Culp (Dalton State College), rculp@daltonstate.edu
Discussant: Craig Rogers (Canisius College), rogersc@canisius.edu

Title: Industrial Clusters in the Buffalo-Niagara Falls, NY MSA: A Regional Economic Development Panacea?
Author: Craig Rogers (Canisius College), rogersc@canisius.edu
Discussant: Jeffrey Wagner (Rochester Institute of Technology), mjwgse@rid.edu

Title: Economics of Active Transportation Perceptions: A Case Study

Authors: Jeffrey Wagner (Rochester Institute of Technology), mjwgse@rid.edu
Lucas Dorsey (Economics Dept., RIT), lbd4563@rid.edu
Discussant: Abeba Mussa (Farmingdale State College), mussaa@farmingdale.edu

Title: Is there Discriminatory Mortgage Pricing Against Minorities in the American Lending Market?
Author: Abeba Mussa (Farmingdale State College), mussaa@farmingdale.edu
Discussant: Robert Culp (Dalton State College), rculp@daltonstate.edu

Session 43 Econ Dev
2:25 to 3:45 pm
Chair: Manimoy Paul (Siena College), mpaul@gmail.com

Title: Continuity or Change? Financing Sport in the Russian Federation
Author: Emese Ivan (St. Johns University), ivane@stjohns.edu
Discussant: Luis Portes (Montclair State University), portesl@mail.montclair.edu

Title: Aggregate Effects of Women's Empowerment
Authors: Luis Portes (Montclair State University), portesl@mail.montclair.edu
Vidya Atal (Montclair State University), atalv@mail.montclair.edu
Discussant: Richard Vogel (Farmingdale State College, SUNY)

Title: Integration of Sustainable Development on Long Islands Coastal Industries
Authors: Sheng Li (Farmingdale State College), lis@farmingdale.edu
Nanda Viswanathan (Farmingdale State College, SUNY), nanda.viswanathan@farmingdale.edu
Richard Vogel (Farmingdale State College, SUNY), richard.vogel@farmingdale.edu
Discussant: Vidya Atal (Montclair State University), atalv@mail.montclair.edu

Title: Economic Factors Affecting the Well Being of Country
Authors: Manimoy Paul (Siena College), mpaul@gmail.com
Ankit Desai (Siena College), ad15desa@siena.edu
Discussant: Emese Ivan (St. Johns University), ivane@stjohns.edu

Session 44 Labor and Demographic Economics
2:25 to 3:45 pm
Chair: Michael McAvoy (SUNY College at Oneonta), michael.mcavoy@oneonta.edu

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Title: Developing Chattel during the Wild West Days of Baseballs 1880s: Transferable Claims on Labor Services

Author: Michael McAvoy (SUNY College at Oneonta), michael.mcavoy@oneonta.edu
Discussant: Kameliia Petrova (SUNY Plattsburgh), kpetr001@plattsburgh.edu

Title: Part-Time Entrepreneurship and Risk Preference
Author: Kameliia Petrova (SUNY Plattsburgh), kpetr001@plattsburgh.edu
Discussant: Xu Zhang (Farmingdale State College), xu.zhang@farmingdale.edu

Title: Post-Immigration Labor Market Attributes and Being Entrepreneurs among Immigrants in the United States

Author: Xu Zhang (Farmingdale State College), xu.zhang@farmingdale.edu
Discussant: Michael McAvoy (SUNY College at Oneonta), michael.mcavoy@oneonta.edu

Session 45 Health, Education and Welfare
2:25 to 3:45 pm
Chair: Bilesha B. Weeraratne (Institute of Policy Studies of Sri Lanka), bilesha@ips.lk

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Title: Impact of Medicaid Policy Changes on Immigrant Parents
Author: Aig Unuigbe (CUNY Graduate Center), aunuigbe@gradcenter.cuny.edu
Discussant: Ryan M. McKenna (Stony Brook University), rmmckenna@gmail.com

Title: Is HIT a Hit? The Impact of Health Information Technology on Inpatient Outcomes

Author: Ryan M. McKenna (Stony Brook University), rmmckenna@gmail.com
Discussant: Bilesha B. Weeraratne (Institute of Policy Studies of Sri Lanka), bilesha@ips.lk

Title:	Does e-learning have an Effect on Educational Progress and Improvements in Mathematics in Sri Lanka?
Author:	Bilesha B. Weeraratne (Institute of Policy Studies of Sri Lanka), bilesha@ips.lk
Discussant:	Kyongssei Sohn (SUNY Brockport), ksohn@brockport.edu
Title:	The Cost of Treating Lateral Epicondylitis
Authors:	Kyongssei Sohn (SUNY Brockport), ksohn@brockport.edu Anthony Fillmore (University of Massachusetts Medical School) Edward Calkins (University of Massachusetts Medical School), edward.calkins@umassmemorial.org
Discussant:	Ryan M. McKenna (Stony Brook University), rmmckenna@gmail.com

4:00 pm - 5:00pm Business Meeting (All Are Welcome)