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The Effects Of Social Spending On Economic Growth And Standards Of Living Within U.S. States

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THE EFFECTS OF SOCIAL SPENDING ON ECONOMIC GROWTH AND STANDARDS OF LIVING WITHIN U.S. STATES

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This thesis meets the standards for appearance, conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

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Derek J. Ebeling
27 April 2016

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ABSTRACT

Social spending is a large and controversial program within the United States. Though a number of studies examined its effects on Gross Domestic Product ("GDP") between countries, very few specifically looked at its effectiveness solely within the United States. By doing so, international political policy deviations are controlled for. Further, most studies neglect the externalities of social spending on living standards. This paper fills these gaps by utilizing two US Census aid data sets – state & local spending and federal aid & transfer payments – for all 50 states to study the effects of social spending on Gross Domestic Product, Income, and Personal Consumption Expenditures

Using two-stage residual inclusion estimation, the analysis first predicts social spending variables using its lags and Gross Domestic Product, Income, or Personal Consumption. In the second stage, the first-stage residuals predict Gross Domestic Product, Income, or Personal Consumption. Using this method, the short-term positive marginal benefits were found for Housing (≈$12 on GDP and income), Incapacity (≈$3 on income), Workers' Compensation (≈$31 on GDP and income) and Other (≈$1.75 on income and personal consumption) spending. Negative effects were found to varying degrees on GDP, income and personal consumption for Family, Health, Labor, Unemployment and Old Age spending. Most variables were consistent between the two datasets and with prior studies. However, differences in the direction from prior studies of the effect on Gross Domestic Product arose for Health, Old Age and Unemployment.

Additionally, this paper looks into the interplay of politics with social spending. In particular, how particular years, the political party and gubernatorial turnover are related to social spending and its effects on both the economy and standards of living. Both Labor and Welfare spending show strong influences from political policies.

CHAPTER I

INTRODUCTION

Since Franklin D. Roosevelt introduced the New Deal in 1933, social spending, in one form or another, has been a significant government program in the United States, and yet, despite its longevity, the expenditure of public funds has remained a topic of constant debate. On one side, some argue that the United States is unfairly providing too many handouts at the expense of hardworking individuals, other government programs, businesses, and the rich. Simultaneously, others claim that social spending maintains a minimum standard of living and subsistence, increases buying power, and reduces crime. These positions stem from one's political attitudes, demographic background, and religious inclinations, in addition to the varying degrees of generosity, inclusiveness, and attitudes toward redistribution fostered by the same (Huber, Mustillo& Stephens, 2008). For liberals and conservatives, the resounding constant question is not just one of how to spend the money, but whether the government receives a positive return on its investment beyond the noble self-satisfaction and venerable social flattery provided to the politicians and their constituents. This paper seeks to place a tangible monetary value on social spending for a better society, particularly within the United States.

With one side saying yes to social spending and another side saying no, it is first important to establish how to measure a positive return. The stereotypical conservative will tend to focus on the economic return, while the liberal focuses on social returns. This paper will look at both by examining short-term effects of social spending on three different variables. These are Gross Domestic Product ("GDP"), income, and personal consumption. (The collection

of these dependent variables will here in be referred to as the "Macro Dependent Variables" [Table 1].) GDP focuses on the total economic performance gains as a result of social spending, while income and consumption highlight the economic gains in human well-being as a result of social spending programs. The theoretical economic impact of social spending on GDP should feature increases in demand via public consumption by investing in low-income individuals, increases in output through employment and increases in human capital through health funding. Potential decreases on output exist through retirement induced labor reductions and invalidity benefits (Furceri & Zdzienicka, 2012). In addition to the direct economic benefits of GDP, analysis of income and personal consumption expenditures ("PCE") give insight into the living standards of individuals through their spending habits. Together, these variables should provide a well-rounded view into the national externalities of social spending.

Prior research into the effects of social spending has traditionally focused on GDP, with little attention paid to changes in standards of living. Additionally, these studies have overwhelmingly been conducted at an international level. In particular, a disproportionate amount of research has centered on countries within the Organization for Economic Cooperation and Development ("OECD"), although one study did feature countries within Latin America while another focused solely within Canada. Surprisingly, only one study, Horváth et al. (2014), specifically examined states' GDP within the United States. Further, the analysis of social spending on consumption, providing insight into living standards, is unprecedented, as annual statewide consumption data from 1997 to 2012 was released for the first time in August 2014. The broad range of social and economic variability from international analysis may provide a greater range of data, but it simultaneously obscures finer details. By exclusively contemplating social policies within the United States, this paper will help politicians interpret the impact of

internal social programs' costs through the lens of our own unique social and economic construct.

Traditionally, papers have highlighted nine areas of social spending, not due to any particular insight, but due to the manner of OECP data collection. State census data, available via two different sets, is not provided in the same format. The first set, a combination of state and local data("State and Local Data"), compiled in Table 2, focuses on broad areas of spending and state contributions, while the second set ("Federal Data"), compiled in Table 3,emphasizes particular federal aid programs which redistribute money to states through various government programs and transfer payments to individuals. The Federal Data combines government spending into eight (as opposed to nine) categories which directly mirror the OECD studies. The two datasets, though overlapping, offer slightly different insights; for example, the State and Local Data includes education, which Federal Data excludes. To prevent endogeneity, an instrumental variable ("IV") approach, building on the work of Furceri and Zdzienicka(2012), uses residuals of each variable of interest as the IV for regression.

The results showed positive short-term economic impacts on the GDP, income, and PCE from Housing, Incapacity, Workers' Compensation and Other. Housing and Workers' Compensation showed the largest and most significant effect. Family, Health, Labor, Unemployment, and Old Age all showed negative effects[1]. Labor spending had the largest short-term negative effect. The only variable to show both positive and negative effects on the range of dependent variables was Education spending.

The remainder of this paper explores past and present methods, impacts and observations of social spending. Section II gives a detailed literature review on prior work done

[1] All variables are capitalized throughout the paper. For clarity of combined insight, variables from both data sets of similar composition use the same name. When necessary, this paper will specify the data set with which a particular variable is associated.

by authors on related topics. Section III goes over data relevance and sources. Section IV reviews the methodology used, while Section V presents the empirical analysis and raw results. Section VI expands on the findings by spending category and offers additional insights. Finally, Section VII concludes with impacts and the way ahead.

CHAPTER II

LITERATURE REVIEW

Past literature on social spending has focused primarily on returns in GDP to determine its effects, with the majority of the literature indicating some form of positive returns to GDP (Furceri & Zdzienicka, 2012; Gupta, Clements & Tiongson, 1998; Huber, Mustillo & Stephens, 2008; Clemente, Marcuello & Montañes, 2012; Wang, 2005; and Stenberg et al., 2014). Other authors have cited specific areas of the economy in which social spending increases economic returns. These areas include increases in private output (Fatas & Mihov 2001), stabilization of the economy (Furceri, 2010), and an increase in economic risk taking (Bird, 2000). Many studies have shown that investments in social spending create a positive economic return in GDP, but vary in degree. The expansionary effects of social spending on the economy has been noted by Fatas & Mihov (2001) as being greater than one and by Furceri & Zdzienicka (2012) at about 0.6. However, Lindert (1996, 2004) states that variations in social spending across nations has not led to slower growth or lower incomes among nations spending 10-33% of GDP on welfare programs. But what is the best course of action? When it comes to social spending, how much and where should we be investing?

It is important to look at not just the agglomerated dollar amount of social spending, but also its individual components (Wang, 2005). Typical categorization of welfare programs in OECD studies have been old age, survivors, incapacity, health, family, active labor market, unemployment, housing and other (Furceri 2010 and Furceri & Zdzienicka, 2012). Prior literature has found that those programs in which social spending has had the most positive

influence on GDP have been old age, health and unemployment, though survivors and education have been mentioned as well (Fatas & Mihov, 2001; Furceri, 2010; Furceri & Zdzienicka, 2012; Huber et al., 2008; Wang, 2005). The preferred method of implementing these variables into regressions has been as a percentage of GDP, and is sometimes called welfare effort (Olaskoaga-Larrauri, Aláez-Aller, & Díaz-De-Basurto, 2009).

The most common indicator of successful welfare programs has been GDP; it is simple and easily understood. Yet, despite GDP's obvious benefits, it may not be the best or only indicator of successful government social spending. GDP ignores wealth variation, income flows, household produced services, destruction of the environment, and determinants of well being (Fleurbaey, 2009). In other research, Huber et al. incorporated GDP per capita as an independent variable for social spending; indicating social spending varies with economic outcomes and therefore requires other indicators of success. Fleurbaey (2009), Escosura (2010) and Gupta et al. (1998) focus on effects of human development. Specifically, Fleurbaey states that human development, or rather "knowledge and…access to resources needed for a decent standard of living," is a better indicator of success for developing countries as it can lead to future economic gains. However, the American Human Development Report, which captures state data, is biennial and only goes back to 2009; making it a poor indicator of human well being for this study. Instead, household income and PCE are used as they more closely mirror material living standards than GDP (Stiglitz, Sen, & Fitoussi, 2009). Both GDP and human welfare, which can lead to future economic gains, are examined as indicators of social spending success.

The majority of work on social spending and its relationship to GDP has focused on country level data, particularly within the OECD countries. Though some authors have focused on other country groups like the Gulf Cooperation Council of countries (Al-Faris, 2002) and Latin

America (Huber et al., 2008), these studies are few. Data within countries is even harder to find. Wang (2005) is one of the few authors who explores domestic data, examining empirical evidence in health and education from Canada. Only one study specifically compared state level data across the United States, Horváth et al. (2014), which analyzed GDP effects across departments. There, they found that spending by the Department of Health and Human Services and the Department of Labor have negative effects, while outlays by the Department of Commerce and the Department of Interior have positive effects. Unlike these papers that solely examine state social spending effects on GDP, this paper also captures the impacts on human development through analysis of income and personal consumption expenditures.

When comparing countries, there are numerous differences at play affecting the outcomes of social policies on GDP. These differences both aid and hinder analysis. Bird (2000) notes that "sufficient variation in Welfare State measures…requires a dataset that crosses major jurisdictional boundaries" (pp. 358). However, by focusing within a country, we can examine a finer level of regional politics and philosophies at play in social spending outcomes that meet national expectations with regional implementation. Huber et al. (2008) notes when analyzing data for Latin America that modifications have to be made from the typical OECD country analysis. The same is true in analyzing state data due to local level politics, economies, culture, and more significantly, available data.

Implementation will follow in the footsteps of Clement et al. (2012) and Furceri & Zdzienicka (2012). These analyses focus on a range of social variables while examining not only the effects in GDP, including its multiplier effect, but also effects on investment and the private sector. They include different income levels, income elasticity, unit roots for time series properties and account for possible reverse causation of GDP to deliver a robust analysis.

Likewise, we cannot neglect that an increase in GDP leads to more money available for expanding the role of government and increasing social spending (Al-Faris, 2002). It is also sensitive to the "ups and downs of economic growth" (Clement et al., 2012). An increase in GDP will potentially lead to reverse causation. Furceri & Zdzienicka (2012) address this by identifying government-spending shocks and estimating a policy rule for social spending, while many other authors seem to ignore the possible effects of endogeneity.

Overall, this paper seeks to add value to the existing literature by finding the social policies that are best in advancing the general welfare of the United States, not countries in general, through their short-term impacts on GDP, income and PCE. Additionally, it provides insight on, not just economic, but political influences of social policies. The results hope to guide future non-partisan decisions on social policy.

CHAPTER III

DATA

State GDP data comes from the Bureau of Economic Analysis ("BEA") and is given in both total and per capita terms. Though the data goes back to 1987, there is a discontinuity in the data in 1997 when data collection changed from the Standard Industrial Classification ("SIC") to the North American Industry Classification System ("NAICS"). NAICS, the newer data set, is more consistent with US GDP definitions[2]. Further, state PCE data is only available from 1997-2012. Due to GDP data standardization differences and PCE data availability, analysis is restricted from 1997 onward. GDP, based on NAICS data, is given in 2009 dollars and all other data is converted to 2009 dollars to match.

Social spending data is taken from three US Census Bureau sources. State and Local Data comes from the *State and Local Government Finances* of the Census of Governments, sorted by state, which provides information on the structure, function, finances, and employment of over 90,000 state and local governments. The applicable social spending data, in the expenditure section, divides the data into general areas, those of interest include: Education, Employee Retirement, Health, housing & community development ("Housing"), Social Insurance, Unemployment, veteran services ("Veteran"), Welfare, Workers' Compensation and other insurance trusts ("Other")[3]. A concern with government finance data

[2] The BEA states "there are differences in source data and different estimation methodologies. This data discontinuity may affect both the levels and the growth rates of GDP by state. Users of GDP by state are strongly cautioned against appending the two data series in an attempt to construct a single time series for 1963 to 2014. For more information visit http://www.bea.gov/regional/docs/product/.

[3] For a full list of applicable welfare variables from *State and Local Government Finances* see Table 2.

is that many state governments have different fiscal years, not only from federal fiscal years, but also from each other. The use of lagged data minimizes these differences.

The data described above does not provide insight on how federal aid was allocated to the federal programs within the state. Section 8 (of the annual Statistical Abstracts produced by the US Census Bureau) includes a table for *Federal Aid to State and Local Governments by State* for the most recent years, which shows how federal aid was allocated among states for specific programs such as Women, Infants, and Children; Head Start; No Child Left Behind; Medicare & Medicaid; and others[4]. This data, in conjunction with the US Census Bureau's *Government Transfer Payments to Individuals by State* data from Section 11 of the annual Statistical Abstracts, are the sources for Federal Data. Government transfer payments include information on retirement & disability insurance, medical payments, income maintenance benefits, unemployment benefits, veteran's benefits, federal education & training assistance, and other. To mirror the OECD spending variables in other studies, these two federal datasets are combined by examining the OECD database[5]; specifically the composition of variables that make up United States social spending. For each category of social spending, matching variables from the Federal Aid and Transfer Payment dataset and the Transfer Payments to Individuals dataset were applied (Table 3).

Data comprising State and Local Data as well as Federal Data are not mixed when regressing due to high levels of multicollinearity that exist between them. This is because much of the data represents opposite ends, allocation and distribution, of the same programs. As such, separate regression analyses for each dataset were performed.

[4] For a complete list of the welfare programs from the table *Federal Aid to State and Local Governments by State*, which is included in Section 8 of the US Census Bureau Statistical Abstract, see Table 3
[5] The OECD Social Expenditure Detailed Data Set can be found at http://stats.oecd.org/viewhtml.aspx?datasetcode=SOCX_DET&lang=en

Prior studies have generally divided social spending into nine categories because of how the Organization for Economic Co-operation and Development (OECD) formatted their statistics. These included old age, survivors, incapacity related, health, family, active labor market program, unemployment benefits, housing, and other policy areas (Furceri & Zdzienicka, 2012). While the US Census does not summarize its data in this manner, the combination of its categories can be distributed, for Federal Data, such that it encompasses the same OECD categories, with the exception of the survivor category.

In addition to GDP as a dependent variable, which may have endogeneity with social spending, personal consumption expenditure and income growth are used. These provide a second, and arguably better (Stiglitz, Sen, & Fitoussi, 2009), reference of human well-being than GDP. Furceri & Zdzienicka (2012) found that social spending had positive effects on consumption using OECD country level data. They also noted that the welfare component of expenditure, in relation to economic activity, is largely ignored in the literature. The BEA released data on *Personal Consumption Expenditures by State* for the first time on August 7, 2014 as prototype estimates and covers the years 1997 to 2012 (in nominal dollars). The BEA also provides data on state income through quarterly news releases compiled via online interactive tables.

An introductory analysis of the data is provided in Figures 1, 2 and 3, which compare State and Local Data from the *State and Local Government Finances* to state GDP. From these graphs we can see an obvious correlation between GDP and social spending. The first graph, Figure 1, shows states with higher social spending, the left side of the graph, also have comparatively higher GDPs. Likewise, in Figure 2, we plot each state's social spending and GDP by year. An OLS regression on this data has a highly significant (0.1%) and very positive upward

trend coefficient of 4.66 indicating that for each dollar spent on welfare, GDP increases by $4.66. The R^2 is 0.3642.

Figure 1. Mean State Welfare Spending Per Capita & Mean GDP per Capita, 1997–2012

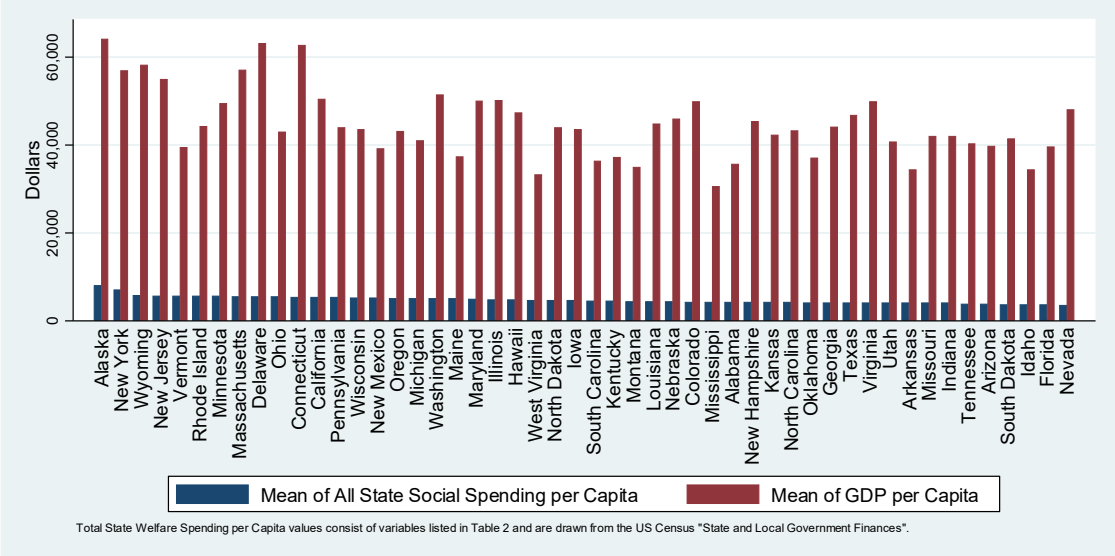
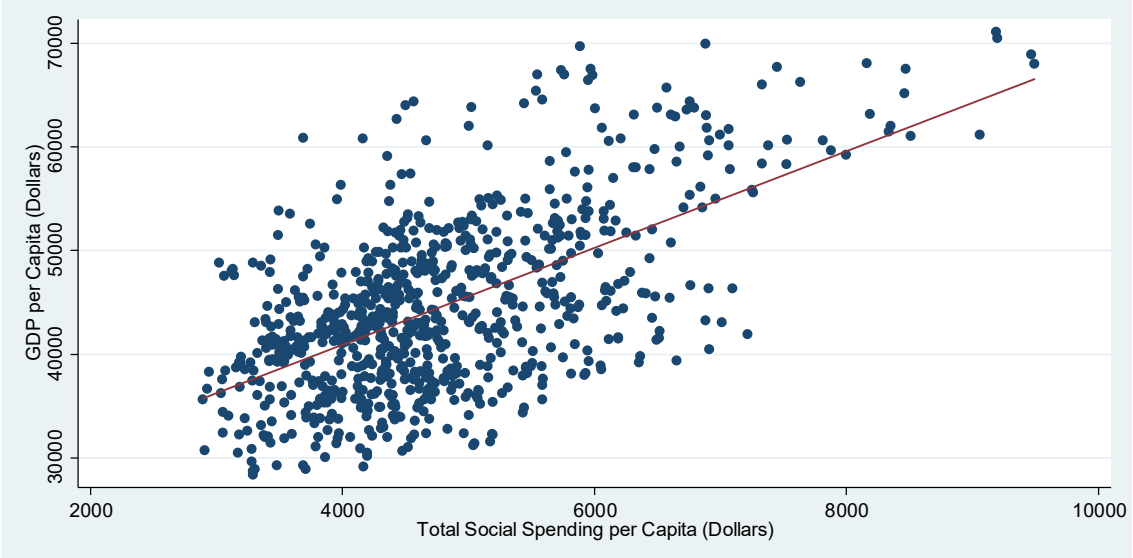


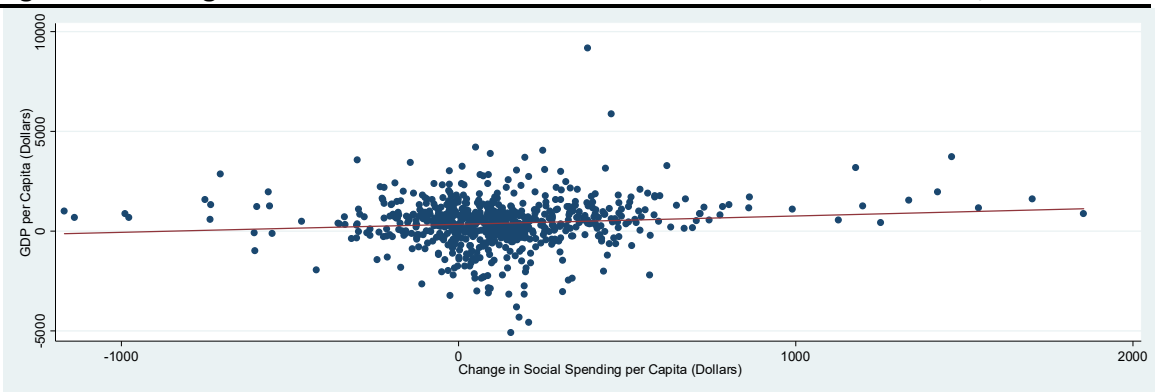
Figure 2. State and Local Government Finances vs Same Year GDP, 1997–2012



Regressing with the differences (Figure 3), using the second lag of all social spending from State and Local Data, finds an increase of $0.85 per change in dollar spent, a significance of

less than 0.1, and and R^2 of 0.0445. Though these graphs do not prove causation, the correlation is apparent and warrants the study of this paper.

Figure 3. Two Lags of Difference in State and Local Government Finances vs GDP, 1997–2012



As discussed earlier, final data analysis on the Macro Dependent Variables, in per capita terms, is executed in two main groups: State and Local Data and Federal Data. State and Local Data spending utilizes *State and Local Government Finances* variables with no modification. This includes Education, Employee Retirement, Health, Housing & Community Development, Social Insurance, Unemployment, Veteran Services, Welfare, and Workers' Compensation (Table 2). The Federal spending analysis combines both the *Federal Aid to States* and *Federal Transfer Payments to Individuals* into variables that mirror the international OECD analyses. These include: Family, Health, Housing, Incapacity, Labor, Old Age, Unemployment, and Other (Table 3). By executing the analysis in groups, we avoid the endogenity issues outlined earlier.

Control variables (Table 4) focus on both the population and the economy. These include population growth, distribution, unemployment, educational attainment, and income shares. In addition, variables for gubernatorial party in power, governor turnover and voting years are used for model predictions. These variables account for political maneuvering that

often leads to changes in social policies, thus allowing the focus to remain on actual dollars spent.

CHAPTER IV

METHODOLOGY

The empirical methodology employed follows and builds on standards set by previous authors (Clemente et al, 2012; Lindert, 1996; Wang, 2005). The equations below are based primarily on the OECD country-level social spending to GDP analysis used by Furceri & Zdzienicka (2012); who themselves reference Romer & Romer (1989) to estimate the impacts of public spending on output. This equation set was chosen for its proven use in prior literature and its ability to isolate effects of the dependent variable, whereby social spending is treated as a shock to the Macro Dependent Variable. Succinctly, the following equations use the lags of the change in social spending variable and the change in the per capita Macro Dependent Variables to predict the change in each social spending variable. Finally, to predict changes in the Macro Dependent Variables, the residuals of the change in the social spending variables are used. In doing so, the possibility of reverse-causation from the Macro Dependent Variables on the variable of interest, social spending, is controlled for.

The basic model, equation (1), is based on a simple dynamic growth model with social spending as the independent variable of interest. The inclusion of lags of the dependent variable corrects for autocorrelation, while differencing the equation addresses omitted variable bias and removes time invariant factors. This is modeled below:

$$(1) \qquad \Delta y_{it} = b_t + \sum_{j=1}^{3} \beta_j \Delta y_{i,t-j} + \sum_{j=0}^{3} \delta_j \Delta s_{i,t-j} + \gamma' X_{it} + \varepsilon_{it}$$

The parameter of interest, δ, reflects the impact of a vector of social spending, *s,* on GDP per Capita ("GDPpC"), *y.* In addition, *b* are time-fixed effects, β corrects for autocorrelation, *X* contains a vector of control variables which can affect short term growth, and ε is the error term. Prior to finding the difference equation (1), fixed effects were split between state and time to account for consistent output by state that is non-time dependent (state-fixed effect) and changes in national policy that vary each year, but are constant for each state (time-fixed effect) . State-fixed effects cancel out with the difference equation, but since time-fixed effects are time-variant, they remain in the equation[6]. The *X* vector contains data such as political party, growth of the surrounding states, and population growth.

The primary problem with equation (1) is the potential for endogeneity between GDP and social spending as either more money becomes available or as policy makers attempt to stabilize the economy. This is primarily due to the flow of reverse causation, which given by equation (2). Estimations of fiscal reaction functions by Darby and Melitz (2008) found social spending to be counter-cyclical to GDP. This indicates that $\theta < 0$. With opposite signs for social spending and growth, this implies δ_j is biased downward (Furceri & Zdzienicka, 2012), which could result in zero or negative results in OLS estimations for social spending on GDP even if the actual effect is positive.

(2) $$\Delta s_{it} = \theta \Delta y_{it} + \xi_{it}$$

Furceri & Zdzienicka (2012) parallel other growth studies by developing a fiscal reaction function, equation (3). Here we will estimate social spending for each state instead of by country.

[6] Specifically, in the difference equation, b_t represents the change in the time-fixed effect.

(3) $$\Delta s_t = Trend_t + \sum_{j=1}^{2} \alpha_j \Delta s_{t-j} + \sum_{j=0}^{2} \theta \Delta y_{t-j} + \emptyset' Z_t + \xi_t$$

In this policy equation, we have a time trend and a vector Z, which controls for various state and population attributes, including the initial state debt to GDP ratio, initial ratio of social spending to GDP, income distributions (using the Gini or Theil Indexes), gubernatorial turnover, significance of voting years, and age & race distributions. The lagged values of social spending account for the normal dynamics of the series (Romer and Romer, 1989) and include both linear and exponential effects to allow for initial short term increases and then decreases as its spending fluctuates. An evaluation of each regression of social spending using the Breusch-Pagan Lagrange multiplier, to test for state random effects, and the Hausman test, to compare state fixed and random effects, was performed. In all cases, the pooled OLS, with year fixed effects, was the best regression.

Time fixed-effects, in both equation (1) and (3) address national changes in the economy for the given year. Its inclusion addresses national business cycles as well as changes to federal law, policy, trade, and other factors influencing the economics of all 50 states.

To correct for reverse causation, there are two possible methods. The first is to use a two stage IV approach. In this method, Lindert (1996) suggests using non-GDP related determinants of social spending, including income effects, electoral variables, and age distribution. These IVs attempt to capture the type of person that idealizes a need for social spending within their communities. Despite Lindert's conclusions, many of the variables in this paper's data had effects on GDP in the short term.

The second method is a form of two-stage residual inclusion estimation introduced by Furceri & Zdzienicka (2012). The residuals from the OLS regression represent the portion of

social spending not effected by GDP. By replacing the independent variable for social spending, *s*, from equation (1) with the residuals, ξ, of equation (3), the short-term impact of social spending on GDP can be estimated with one direction of causation. The residuals act as a pseudo instrumental variable, having been predicted from GDP, but not related to GDP. When tested for possible correlation with the other independent variables, *X*, the residuals showed a correlation of under 0.1 for the strong majority of the variables and their lags; the most common variables to show a correlation greater than 0.1, though still rarely exceeding 0.2, included the population of black individuals, the Gini coefficient, and Voting Year. The parameter of interest remains δ.

$$(4) \qquad \Delta y_{it} = b_t + \sum_{j=1}^{3} \beta_j \Delta y_{i,t-j} + \sum_{j=0}^{3} \delta_j \xi_{i,t-j} + \gamma' X_{it} + \varepsilon_{it}$$

Though GDPpC is a known and reliable indicator of economic performance, as we noted earlier, it is not the best indication of human well-being. To acquire a fuller picture of the effects of social spending on our society, we model Equation (5) for Income per Capita ("IpC") and Equation (6) for PCE per Capita ("PCEpC") after Equation (4).

$$(5) \qquad \Delta i_{it} = b_t^* + \sum_{j=1}^{3} \beta_j^* \Delta i_{i,t-j} + \sum_{j=0}^{3} \delta_j^* \xi_{i,t-j}^* + \gamma' X_{it}^* + \varepsilon_{it}^*$$

$$(6) \qquad \Delta c_{it} = b_t^{**} + \sum_{j=1}^{3} \beta_j^{**} \Delta c_{i,t-j} + \sum_{j=0}^{3} \delta_j^{**} \xi_{i,t-j}^{**} + \gamma' X_{it}^{**} + \varepsilon_{it}^{**}$$

The control variables, both the *X* and *Z* vectors, come from the same pool of control variables. The control variables, *Z*, utilized in predicting each social spending variable are

repeated, though only if significant, in the *X* vector of the equations (4), (5), and (6) for the Macro Dependent Variables. New ones are then added to better predict growth. By doing so, we factor out the potential correlation between the controls and the social spending variables of interest in the final regressions on the Macro Dependent Variables.

CHAPTER V

EMPIRICAL ANALYSIS

Results are presented in two sections. Section V.1 includes results from State and Local Data's government finances and Section V.2 is the results from Federal Data (the combination of Federal Aid and Individual Transfer Payments) finances.

V.1. State and Local Government Finances

The government finance areas, from State and Local Data, of Education, Social Insurance, Unemployment, and Workers' Compensation had an effect on two or more of the Macro Dependent Variables. The areas of Health, Housing, Retirement, and Veteran spending had an effect on only one Macro Dependent Variable. Welfare spending was not significant on any Macro Dependent Variable regression.

The first stage process predicted social spending, using equation (3), for each social spending category based on past spending, additional independent variables, and lags of the Macro Dependent Variables. To avoid correlation and to factor out the effects of GDP and Income/PCE independently, such that the appropriate residuals in the second stage regressions on each Macro Dependent Variable are used, regressions of each Macro Dependent Variable are done separately and divided between two tables (Table 5 and 6). Table 5 is spending predictions utilizing GDPpC, but not IpC or PCEpC as an independent variable. Table 6 is spending predictions utilizing IpC and/or PCEpC, but not GDPpC as an independent variable. Because of the high correlation between IpC and PCEpC, typically only one or the other was significant. Though GDPpC, IpC, and PCEpC were independently significant in many equations,

adding controls made them insignificant in the best regression for predicting some spending variables. This was true for Employee Retirement, Housing & Community Development, Social Insurance, Veteran Services, & Welfare. In these cases, the regressions repeat in both tables for easy comparison.

V.1.1. State and Local Government Finances' Effects on GDP per Capita.

In the second stage, GDPpC was analyzed in nine independent regressions, one for each social spending variable of interest, to see if any of the changes in the current and/or past three lags of the residuals of the social spending variables were significant in predicting the Macro Dependent Variables (Equations 4-6). These regressions included fixed year effects and the first and second lag of GDPpC, but no other controls. For GDPpC, only for Education, Housing, and Workers Compensation were significant (Table 7, Columns 1-3).

For Education, only the third lag of the change in spending in education was significant at 0.10%. This, however, has the unexpected sign of -0.74, or rather, for every dollar spent on education, not associated with an increase in GDP, GDPpC decreases by 74 cents. This is a significant difference from a simple regression, which does not utilize residuals; in this model, a one-dollar change in the current year of Education spending was a 46 cent increase in the change in GDPpC. Combining the social spending variables of significance together (Table 7, Column 4) made education slightly more significant, but once controls were added to the equation, Education was dropped all together (Table 7, Column 5). From this, we can conclude, with regard to State and Local Finances, that education, independent of GDP has a slightly negative, but insignificant effect on GDP.

For Housing and Community Development, we see that the second lag has a positive effect of 4.5 at 1% significance and the third lag has an effect of -2.49 at 10% significance. When combined with the other spending variables in column 4, only the second lag is significant. With

controls, neither remain significant. These effects remain similar when regressing on the initial values as opposed to the residuals. Ultimately, these findings show government spending on Housing and Community Development has an overall positive yet insignificant effect.

The residuals of change in Workers' Compensation had a positive effect on GDPpC. This was initially true for the current year, the first lag and the third lag at 1% or less. When combined with the other spending variables and controls, the first lag dropped, while the current year had a multiplying effect of 10.9 and was significant only at 10%, while the third lag remained significant at 1% with a multiplying effect of 21.2. The overall effect remained the same. An increase in spending on Workers Compensation, not associated with an increase in GDP, results in a very significant and powerful increase in GDPpC.

V.1.2. State and Local Government Finances' Effects on Income per Capita.

Having already accomplished the first stage of predicting social spending variables, the second stage process repeats for IpC and PCEpC analysis. Initial independent regressions (Table 8, columns 1-4), with no controls, was significant for current Education spending; the third lag of Social Insurance spending; the second lag of Unemployment Compensation; and the current, first and third lag of Workers' Compensation. Upon combining and adding in controls, (Table 8, Column 6,) Education, Social Insurance, and the current and first lag of Workers Compensation remained significant. A change in each dollar spent on Education had a positive increase of $1.17 in IpC, and a dollar spent on Social Insurance had a positive increase of $21.45 in IpC, but both were only significant at 10%. The only overlapping social spending variable with GDP is Workers' Compensation; the change in spending in the current year had a $10.01 increase in IpC at 5% significance, while its one-year lag had a positive increase of $21.63 in IpC at 0.01% significance. Unemployment compensation, without controls (Table 8, Columns 3 and 5), had a

negative impact of $1.78 at a significance of 1%. However, after adding controls, Column 6, unemployment compensation became insignificant.

V.1.3. State and Local Government Finances' Effects on PCE per Capita.

Initial results for PCEpC using reduced regressions with no controls (Table 9, columns 1-6) of the social spending residuals from Table 6, were significant for Education, Employee Retirement, Health, Social Insurance, Unemployment Compensation and Veteran Services. Besides Employee Retirement, all were significant when combined together and with controls.

Again, like GDPpC, Education had a negative impact on PCEpC. Each increase in dollar spent on Education for the current year resulted in a $0.31 decrease in PCEpC at a 10% significance. In addition, Unemployment Compensation also had a negative impact of $1.32 for each increase in dollar spent of the current year.

Health, Social Insurance, and Veteran Services all had a positive effect on PCEpC. The second lag of Health, significant at 1%, resulted in a $1.67 increase in PCEpC for each change in dollar spent that year. Social Insurance spending, both the current year and the third lag, had a $5.00 (at 5% significance) and $7.08 (at 1% significance) increase in PCEpC respectively. Finally, Veteran Services resulted in a large and very significant (0.1%) increase in PCEpC of $23.56 for each increase in dollar spent.

V.2. Federal Aid and Individual Transfer Payments

Federal analysis, using data from the US Census's *Federal Aid to States* and *Federal Transfer Payments to Individuals* tables, mirrors the categories of OECD international analysis. Here the variables of interest were Family, Health, Housing, Incapacity, Labor, Old Age, Unemployment, and Other. Results had short-term positive economic effects for Housing, Incapacity and Other. However, Family, Health, Labor, Old Age and Unemployment had short-term negative effects.

Figure 4. Federal Aid and Transfer Payments to Individuals vs Same Year GDP, 1997–2010

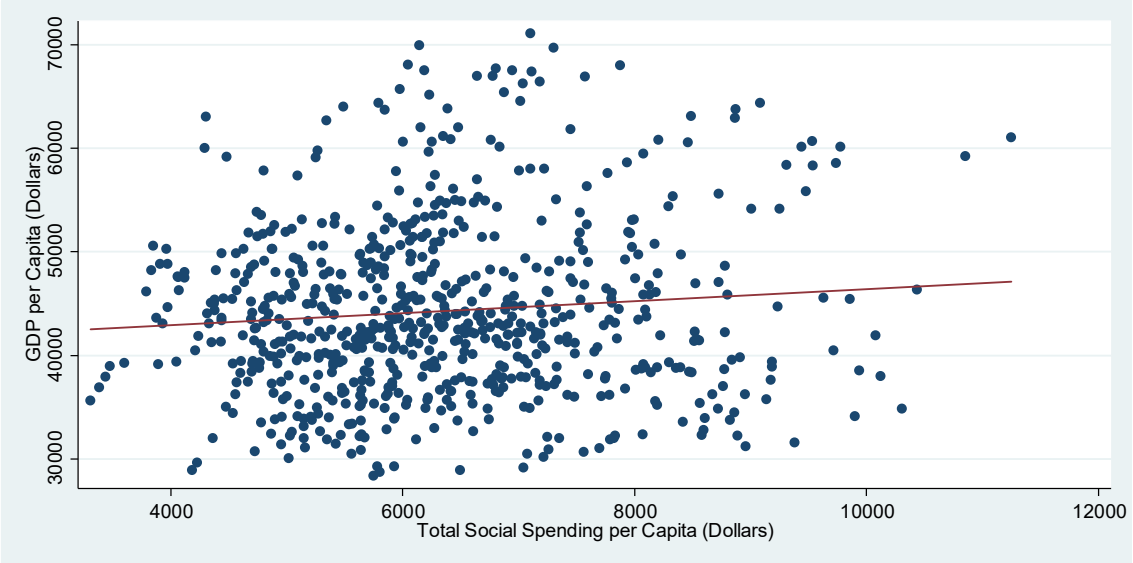
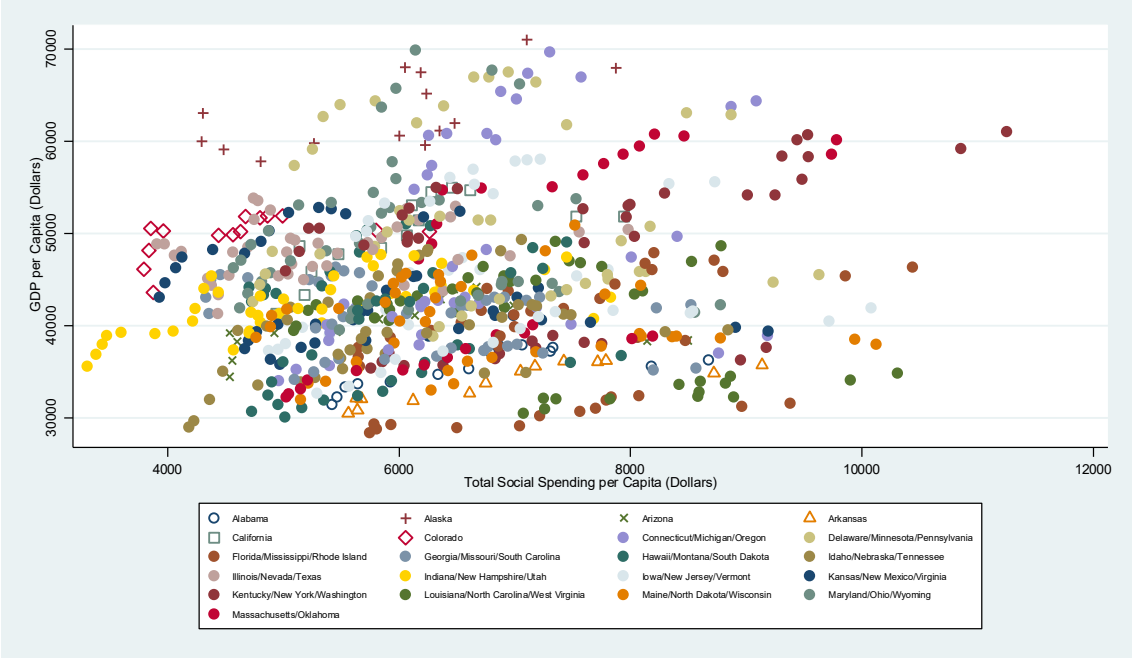


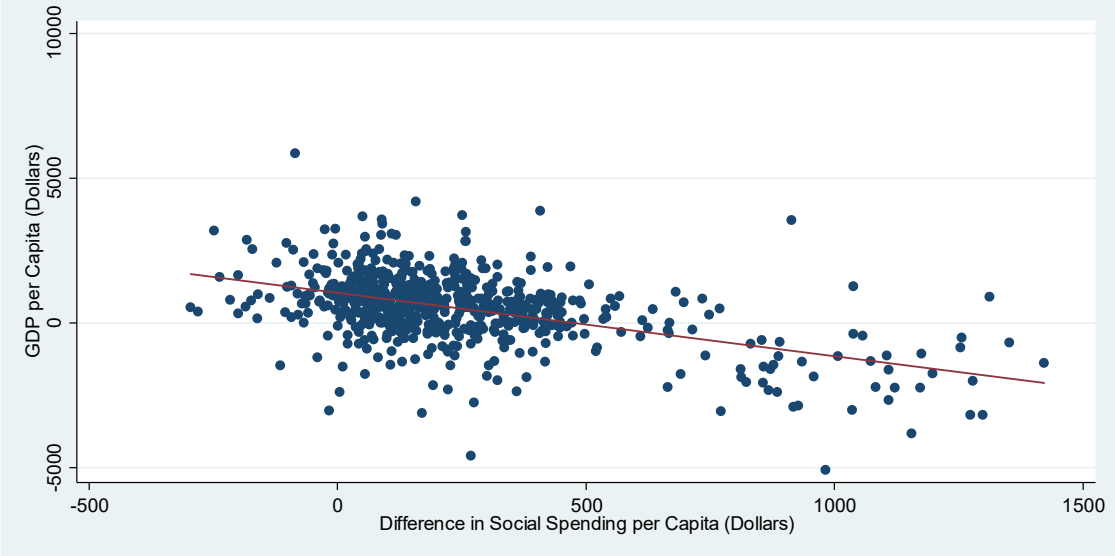
Figure 5. Federal Aid and Transfer Payments to Individuals vs Same Year GDP by State, 1997–2010



An initial plot, with no controls, of all federal spending shows a positive correlation with same year GDPpC of $0.57 at 5% significance and an R^2 of 0.0089 (FIgure 4). In comparison,

when we control for each state using fixed effects, Figure 5, the coefficient increases to $1.913 for each dollar of spending while the *within* R^2 increases to 0.3591.

Figure 6. Difference in Federal Aid and Transfer Payments to Individuals vs Same Year GDP, 1997–2010



In Figure 6, we can see that an increase in the change of social spending is associated with a lower GDPpC of -$2.186 (0.1% significance) for the same year. Note that Figure 6 does not utilize the residuals for IVs. Though the overall trend seems to be postive, the marginal benefit decreases as GDP increases. The negative impacts on GDP can be due to either direct negative effects of federal social spending, where at a certain amount, the poor are enabled to remain poor, or because as a state's GDP declines, the government is stepping in with increased social spending. Further, lags of the change in social spending became insignificant in the first and second year, but the third lag had an opposite and very small positive effect of $0.315 at 10% significance.

To isolate the direction of the causation, the same methods for State and Local Data are used. The first stage predicted federal social spending categories (Equation 3) using past spending, additional independent variables, and lags of the Macro Dependent Variables. Again, to avoid correlation and factor out the effects of GDP and Income/PCE independently, the regressions on GDP and Income/PCE were done separately (Table 10 and 11 respectively). In this data set, GDPpC was significant for each regression in Table 10 and Ipc and/or PCEpC were significant both with and without controls.

V.2.1. Federal Aid and Transfer Payments' Effects on GDP per Capita.

Proceeding in the same manner as in the second stage of the State and Local Data analysis, the only variable that had a positive effect on GDPpC, utilizing Equation 4, with Federal Data (Table 12) was the third lag of Housing. With no controls, Housing, at 1% significance, had a short-term positive effect with a $10.2 increase in GDPpC for each dollar spent. With controls, the effect increased to $11.2 while the significance decreased to 5%.

Spending on Labor, Old Age, and Unemployment all had negative effects within the Federal Data on GDPpC. Labor, without controls, had a negative effect on GDPpC of -$12.36 per dollar spent (5% significance). With controls, this had its significance increase to 1% and its effect nearly double to -$21.16 per dollar spent. The standard deviations for Labor, 6.5 and 4.8 with and without controls respectively, indicate the actual dollar decrease on GDPpC most likely lies between -$12.36 and -$21.16. The second lag of Old Age had a negative effect of -$5.50 without controls and was significant at 0.1%. However, it became insignificant when combined other spending variables and controls. Finally, only the third lag of Unemployment spending had any effect. In this case it was a -$2.63 (10% significance) without controls, and a -$5.86 effect (5% significance) with controls.

V.2.2. Federal Aid and Transfer Payments' Effects on Income per Capita.

IpC saw positive impacts from Housing, Incapacity and Other (Table 13). Housing's third lag had a positive impact at $12.65 with controls for each dollar spent and remained significant at 0.1% in all regressions. Incapacity was significant at only 10%; its largest effect was with controls at $3.69. The first lag of Other showed a positive increase in IpC of $1.75 with 10% significance without controls, but became insignificant when controls were added.

Negative effects on IpC came from Family, Labor, and Unemployment; none of which had a significance greater than 5% (Table 13). The impact of Family spending's 1st lag, initially -$2.23 at 10% significance, became insignificant with controls. Lag three of Labor and lag two of Unemployment spending changes were -$8.03 and -$2.07 respectively (5% significance). With controls, unemployment was dropped and labor increased to -$10.96.

In another approach, the regression is simplified to no Year dummy variables, no lags of IpC, and no controls. IpC is regressed one spending variable at a time on the residuals. With this approach, the only significant variable in predicting income is the third lag of Housing.

V.2.3. Federal Aid and Transfer Payments' Effects on PCE per Capita.

In all cases, except Other, social spending residuals had a negative effect on PCEpC (Table 14). This is true for Health, Labor, Old Age, and Unemployment spending residuals. Only Labor and Other, both with and without controls, were significant at 1%; all other variables were significant at 5% without controls. Old Age became insignificant with controls.

A dollar spent on Health or Labor decreased PCE $0.33 or $6.68, respectively, three years after the fact. Unemployment's second lag decreased PCEpC by $1.04. Spending on Other increased PCEpC by $1.35. Federal aid contributed to an overall negative short term effect on PCEpC.

CHAPTER VI

DISCUSSION

This section summarizes the results from Section V into categories of social spending to compile and explain the results. Where relevant, comparisons are made to previous authors' outcomes. The analyses below pull their conclusions primarily from data presented in Tables 7-9 and 12-14.

VI.1. Education

Education, as the Federal Government does not fund it, has its analysis limited to State and Local data. Here, changes in GDPpC and PCEpC are negative, while its effects on income are positive (Tables 7-9). Horváth et al. (2014) reference research in which only six of 19 studies indicated a significant positive impact on state growth, with the remaining having the opposite or no effects – consistent with this study. Note that the focus of this study is on marginal effects, not overall effects. Additionally, Horvath et al. cited that K-12 spending exhibited no influence and higher education showed negative growth.

Breaking down State and Local spending into K-12 and Higher education exhibited slightly different results for the short term impacts. Simplifying the analysis and focusing on only the education variables, year fixed effects and Macro Dependent Variables, current higher education spending is not significant in short term GDP, but its second lag has a positive effect of a \$1.57 increase for each change in dollar spent on income (p-value 0.072, R^2 = .4903). Lower education had the opposite effects, with no impact on income, and a negative impact of \$0.83

(p-value 0.038, R^2 = .3648) on GDPpC for the third lag of K-12 education spending. The individual effect for K-12 and higher education spending was insignificant on PCEpC.

The results indicate that additional education spending, in the short term, hurts GDP – probably through taxes. However, when these funds are spent on higher education, the net is zero; more or higher quality graduates go into better jobs, stimulating the economy. Additionally, education spending increases income with the majority of the impact coming from inputs into higher education. A decrease in PCE could be expected if lower income families and students, who receive the bulk of education spending, attempt to save more money for additional investment into education. Though government education subsidies make education a realistic goal, where it may not have been before, it does not provide full benefits; requiring additional input from families and taking away from personal consumption.

VI.2. Family & Health

Both Family and Health had negative impacts in the Federal data. Family only affected income by -$2.23 per change in dollar spent and only when regressed separately without controls. Federal health spending had a negative impact of about one-third of a dollar, both with and without controls, on PCEpC. There were no significant Health effects on GDPpC or IpC in Federal Data.

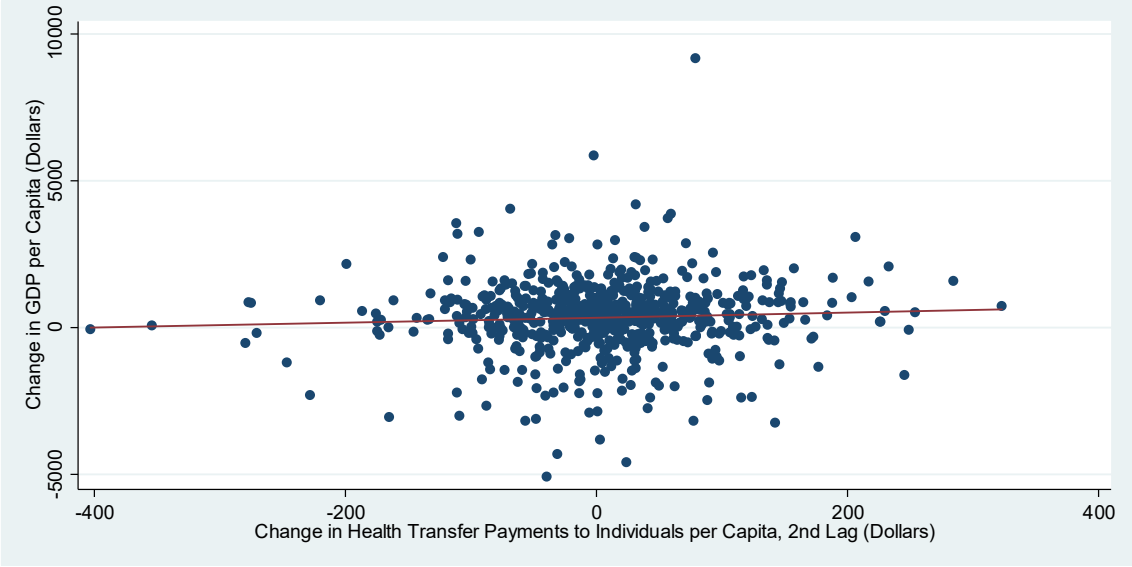
Family and Health spending from Federal data is equivalent to the Public Welfare variable in State and Local Data, (this includes TANF and Medicaid,) and was not significant on either GDPpC, IpC, or PCEpC. The Health var iable in State and Local Data, unlike Federal Data, represents public health services and programs other than hospital care. The majority of the spending on hospital services is from Federal aid.

Other research by Horváth (2014) found health spending, through the Department of Health and Human Services, to be negative on GDP, while Furceri & Zdzienicka (2012) found a

positive large effect. Furceri (2010) also found that health spending smoothed income fluctuations. Here, total public health spending on programs and services (State and Local Data) had significant positive effects on PCEpC of about $1.67 per change in dollar spent.

A further analysis examines only the Transfer Payments to Individuals as opposed to the combination of all federal spending. By including any significant controls, and utilizing the same methodology outlined in Section IV, a result more in line with Horváth (2014) is found for GDPpC. The second lag of health spending (on individuals) results in an increase of $0.98 in GDPpC per increase in dollar spent (5% significance, Adj $R^2 = 0.3453$); indicating that government run programs have too much overhead or lack benefits associated with the direct payments to individuals. We can see these results in Figure 7 below.

Figure 7. Federal Health Transfer Payments to Individuals, 1997–2010



VI.3. Housing

In both data sets, housing had an overall positive effect on all the Macro Dependent Variables where it was significant. In the Federal data, this amounted to over a $10 effect per

change in dollar spent on both GDP and Income per Capita. This is true both with and without controls. In the State and Local data, we also found an overall positive effect on GDPpC, but only without controls. This is the opposite of Furceri & Zdzienicka (2012), whose data shows a negative small impact on GDP.

Supplementing housing may give individuals the chance to make immediate and direct changes to their lives. It frees up income for other needs and allows time to be dedicated to other endeavors like education or other areas of human capital investment. PCE should not be expected to change; low-income individuals, who receive housing subsidies, will tend to continue to spend their entire paycheck to meet basic needs.

VI.4. Incapacity

This facet of social spending includes Workers' Compensation and Supplemental Security Income. In all cases where significant, Incapacity had positive results, which is in line with those from Furceri (2010) and Furceri & Zdzienicka (2012).

In Federal Data, for the Incapacity variable, we saw no changes in GDP or PCE. However, there was a slight positive effect, but only with 10% significance, on IpC from spending in the current period. The analysis of Workers' Compensation in State and Local Data further substantiate these results with large and highly significant effects on both GDPpC and IpC, but no effects on PCEpC. For both GDPpC and IpC, the current period shows a positive impact of $10 per change in dollar spent, but only at 10% significance. Additionally, the combined lagged values of Workers' Compensation spending is significant at less than 1% and as low as 0.1%, depending on the period, with a positive impact of about $21 dollars per increase in dollar spent on both GDPpC and IpC.

Individuals on Workers' Compensation may spend their income on only necessary goods while they search out new jobs, hence the lack of impact on PCE. Further, giving individuals the

time to search out jobs that parallel their skills, instead of settling, not only increases their own income, but, according to the data, helps the economy as well.

VI.5. Labor

Federal data for Labor primarily constitutes various forms of workforce and workforce education investment. It has no State and Local Data equivalent. For every Macro Dependent Variable, Labor has a negative, large, and significant effect ranging from $5 to $21. Concerning GDPpC, labor is significant at 5% in the current year only and its impact increase from -$12.35 to -$21.10 when controls are added. For IpC, Labor has an effect ranging from -$8 to -$11 (at 5% significance) both with and without controls. Finally, for PCEpC, Labor's significance increases to 1%, but its effect is less, though still large, and amounts to -$6.68 with controls per dollar spent.

These effects are not surprising in the short term. People that are learning new trades are less likely to be in the workforce earning income and contributing to GDP. With less income, they are spending less. These negative effects are in line with both Horváth (2014) and Furceri & Zdzienicka (2012). Any positive effects from labor investment would most likely come from long-term benefits.

VI.6. Old Age

Not surprisingly, Old Age had a negative effect – consistent with prior studies. In Federal data, the negative effect on both GDPpC and PCEpC was true for two years after spending the money. Employee Retirement spending, from State and Local data, a subset of Old Age spending within Federal Data, also showed a negative effect in the second lag on PCE.

Though Old Age spending was highly significant on GDP without controls (0.1%), it became insignificant with the controls. This was similarly true for PCE in both Federal Data and State and Local Data analyses, where PCE was significant at 10% without controls and then became insignificant with controls.

Old Age spending, though negative, may be far less impactful when put into perspective of other spending and social factors. It is easy to imagine that regardless of who pays, someone is paying for the elderly; be it the government or the family. For example, when the government pays for the elderly, this money must be raised through taxes, leaving familes with less money to spend – decreasing PCEpC. However, if old age spending is passed on to families, the families will spend their now non-taxed income on the elderly – increasing PCE. The necessity of this expenditure may partially explain why Old Age spending becomes insignificant when combined with other factors. The question left for someone else to answer is whether there are any unintended consequences of deciding who funds this expense.

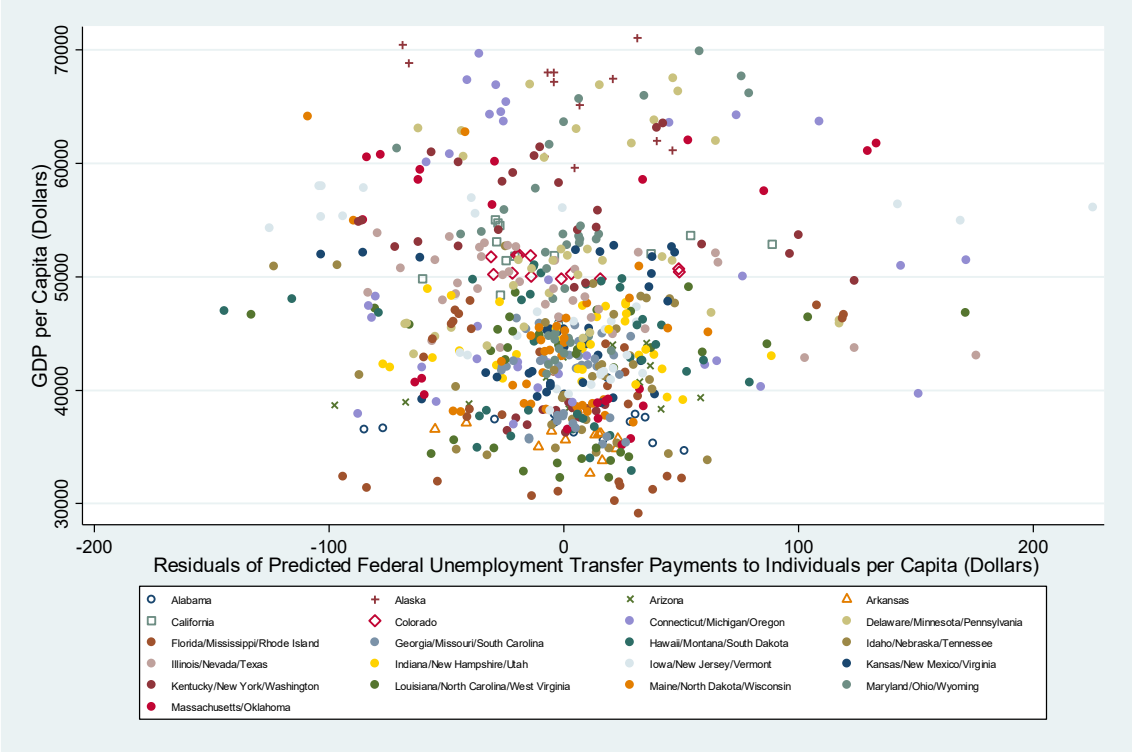
VI.7. Unemployment

In Federal Data, we notice short-term negative effects across the board with Unemployment. Meanwhile, in State and Local Data, we find no effect on GDPpC and a negative effect on IpC and PCEpC. Keep in mind the varying definitions of unemployment in the data. In State and Local Data, Unemployment is the money put away each year by each state into a trust. Federal data on the other hand, utilizing the money provided by states, is the amount of money provided to individuals and its overhead. Further analysis of unemployment on GDPpC, utilizing only the portion of spending that represents transfer payments to individuals (to exclude overhead from Federal Data), gives similar results. This analysis uses state and year fixed effects instead of differencing to predict GDPpC.

First, we predict the residuals of unemployment spending using only GDP and its lags with fixed effects for states and years. This has a within R^2 of 0.8347. Using the 2^{nd} lag of the residual, also with year and state fixed effects, results in a negative effect of $4.38 for each dollar spent on unemployment, a p-value of 0.016, and a within R^2 of 0.3015. This is similar to the original results and is visualized in Figure 8 (below) where different colors represent

different states. Running the same variable directly on GDPpC, without the method above to isolate the effects of GDPpC on Unemployment, the coefficient increases in effect to -10.31 (R^2 = 0.4815 and p-value = 0.000). What this helps to show is that GDPpC plays a significant role in unemployment spending. Since GDPpC decreases more when not controlled for, we can deduce that the amount of GDPpC does play a role in how we allocate money to unemployment spending – a higher GDPpC results in less unemployment spending. Similar results were found for IpC and PCEpC.

Figure 8. Federal Unemployment Aid to Individuals vs GDP per Capita by State, 1997–2010



VI.8. Other

Other social spending includes a number of special projects. These seem to have positive effects, specifically on Income and PCE. In the Federal Data this amounted to around

$1.70 for both Income and PCE at 10% and 1% significance respectively. Other special programs, like Veteran spending, specifically from the State and Local data, showed large ($23.56) increases in PCEpC that are highly significant (0.1%).

These economic gains are most likely due to the highly concentrated and specific efforts and areas that these programs target. This is opposed to the broad base of other programs like TANF or food stamps.

VI.9. Political Insight

This study also garners some insight into the political motivation and timing for social spending through Voting Year variables. In particular, the year just prior to and coinciding with a a congressional voting year. The significance of these years is such that they are not overshadowed by presidential elections. Therefore, congressional representatives are more inclined to follow through on promises or pander to the desires of their constituents. In Tables 5-14, we find that Labor Spending is positive in both these years, while welfare spending (from State and Local Data and consisting of TANF, Medicaid and Social Security Income) goes down only during an election year. Prior analysis indicated that Labor spending has large and positive effects in the current year only. This bodes well for politicians, as they can make a clear impact on their constituents immediately through Labor spending while they or their party run for reelection. Welfare spending on the other hand may go down during an election year because its effects are less noticeable, as indicated by this paper's analysis (where we saw no significant effects to any of the Macro Dependent Variables), and therefore, after having taken office, politicians decrease its spending and redistribute it to other areas. We also see that Congressional Voting Years are associated with positive trends in GDPpC, IpC and PCEpC.

In no case was the party in office ever significant in predicting either the amount of any social spending variable, GDPpC, IpC or PCEpC. This is perhaps due to the tempering of the

opposing parties in office or even a necessity at the local level to overlook bipartisanship to solve immediate problems and not ideologies. Governor Turnover had negative effects on Labor and Other in two periods after coming to office. This coincides with Labor's relationship to voting years. Politicians after establishing themselves in office, are free to decrease labor benefits for other programs without reprisal from constituents. Turnover also had positive effects on Retirement and Housing in the 3rd period after coming into office; likely, due to the time it takes to revamp these programs. The period after governor turnover had Negative effects on IpC; perhaps fueled by an (unnecessary) uncertainty in the economy from newly implement governor programs. Though these ideas are speculation, it is clear that the direction of individual politicians, in congress or the governor's office, does play a role in social spending.

CHAPTER VII

CONCLUSION

The focus of this study is limited primarily to short-term marginal effects. To generalize the results, Housing, Incapacity, Workers' Compensation and Other had positive effects, while Family, Health, Labor, Unemployment and Old Age had negative effects. Most of the variables were consistent between State and Local Data and Federal Data as well as with prior studies. However, differences in the direction of the effect from other studies were found for Health, Old Age and Unemployment. There is a strong and obvious correlation between GDP and total social spending, with the causation of the independent social spending variables having both positive and negative impacts. The same is true for income. PCE tended to decrease with increases in social spending. In the short-term, focusing on incapacity and housing benefits did the most benefit for state economies and individual welfare.

Note that negative results, such as those for unemployment, do not necessarily indicate that all short-term unemployment spending is bad. Instead, they indicate that this type of social spending may simply be above equilibrium. The same holds true for those with positive results, such as Workers' Compensation; where at some point spending too much may start to garner less positive results of even declining results. Adjusting policy and funds to cope for overspending in certain areas and too much prudence in others, may help bring not just higher growth rates in GDP, but higher standards of living for everyone.

Table 1. Macro Dependent Variables

Variable	Details
Gross Domestic Product	By state, 1997 – 2013, Dollars
Income Per Capita	By state, 1997 – 2013, Dollars
Personal Consumption Expenditure	By state, 1997 – 2012, Dollars

*GDP, Income and Consumption data is compiled from tables provided by the Bureau of Economic Analysis.

Table 2. Independent Variables: State and Local Government Finances*

Main Category	Sub Category	% of Total Expenditures[#]	Definition
Education	All Education	29.29%	Includes higher, elementary & secondary, and other education.
Social Services	Public Welfare	14.36%	Includes: 1) Direct payments to beneficiaries under the Federal categorical public assistance programs, Supplemental Security Income (SSI) and Temporary Assistance for Needy Families (TANF); and Medicaid, 2) Cash payments made directly to individuals contingent upon their need, 3) Payments made directly to private vendors for medical assistance and hospital or health care and for services and commodities, and 4) Welfare capital expenditures and employment.
	Health	2.66%	Provision of services for the conservation and improvement of public health, other than hospital care, and financial support of other governments' health programs.
	Employment Security Administration	2.45%	Administration of unemployment compensation systems, public employment services, and the Federal Social Security, Medicare, and Railroad Retirement trusts.
	Veterans' Services	0.03%	Administration of veterans bonus payments and other veterans services NOT classifiable under Public Welfare, Education, Health, Hospitals, Social Insurance Administration, or any other major function.
Housing and Community Development	Housing and Community Development	1.48%	Construction, operation, and support of housing and redevelopment projects and other activities to promote or aid public and private housing and community development.
Insurance Trust Expenditure	Unemployment Compensation	1.84%	Funds held by the U.S. Treasury in a trust account maintained for each participating government by the cooperative Federal-state unemployment compensation insurance system.
	Employee Retirement	5.56%	Cash and security holdings of government-administered retirement systems for public employees.
	Workers' Compensation	0.51%	Cash and security holdings of state government compulsory accident and injury insurance systems for workers' compensation.

* State and Local Finance data can be found at https://www.census.gov/govs/local/. The years 2001 and 2003 do not have state-by-state statistics available. The *Methodology for Summary Tabulations* section, from the *Government Finance and Employment Classification Manual (http://www2.census.gov/govs/class/classfull.pdf)*, provided information to consolidate and rearrange data for 2001 and 2003 to create a state-by-state comparison, however, no CV statistics are available. The same manual is the source of definitions for the above variables.

[#] Percent of expenditures represents the mean of All Expenditures for all states for all years of this study (1997-2012)

Table 3. Independent Variables: Federal Aid to State and Local Governments & Government Transfer Payments to Individuals by State

Variable of Study	Federal Aid to State and Local Governments	Transfer Payments to Individuals	% of Total Aid[#]
Old Age [31.378%]	Social Security Administration		0.002
	DOL - Older American Programs		0.11
	DHHS - Administration on Aging		0.077
		Social Security Benefits	28.381
		Railroad Retirement and Disability Benefits	0.65
		Other Government Retirement and Disability Insurance Benefit	0.224
		Veterans Pension and Disability Benefits	1.934
Incapacity [3.275%]	Special Education and Rehabilitative Services		0.589
	Workers' Compensation		0.835
	Supplemental Security Income Benefits		1.833
Health [42.375%]	FNS – Child Nutrition Programs		0.611
	FNS – Commodity Assistance Programs		0.011
	FNS – Needy Family Programs		0.011
	FNS – Special Supplemental Food Program (WIC)		0.254
	DHHS - Agency for Healthcare Research and Quality		0.004
	DHHS - Centers for Medicare and Medicaid Services		9.253
	DHHS - Health Resources and Services Administration		0.267
	DHHS – Substance Abuse and Mental Health Services Administration		0.148
		Medical Benefits	31.816
Labor [2.185%]	DOE – Vocational and Adult Education		0.097
	DHHS – Job Opportunities and Basic Skills		0.059
	DOL – Workforce Investment		0.164
	DOL – Veterans' Employment and Training Administration		0.01
		Veterans Readjustment Benefits	0.141
		Education and Training Assistance	1.714
Unemployment [2.506%]	State Unemployment Insurance and Employment Service		0.216
	Welfare to Work Program		0.011
		Unemployment Insurance Compensation	2.279
Housing [2.404%]	Community Facilities Grants		0.003
	Rural Housing and Rural Business Cooperative Service		0.071
	Rural, Regional, and Cooperative Development Programs		0.005
	Mutual and Self Help Housing Grants		0.001
	Housing Preservation Grants		0.001
	Rental Assistance Payments		0.068
	College Housing		0.002
	Home Ownership Assistance		0.09
	Housing for Special Populations		0.058

Table 3 cont. Independent Variables: Federal Aid to State and Local Governments & Government Transfer Payments to Individuals by State

Variable of Study	Federal Aid to State and Local Governments	Transfer Payments to Individuals	% of Total Aid[#]
Housing (Continued)	Low Rent Housing Assistance		0.438
	Section 8 Programs		0.54
	Public Housing (1997 only)		0.379
	Housing Certificate Program		0.601
	Capital Programs		0.145
	Support Services		0.002
Family [4.379%]	Supplemental Nutrition Assistance Program (SNAP) [Food Stamps]		0.155
	Child Care and Development		0.228
	Child Support Enforcement		0.136
	Children and Family Services (Head Start)		0.425
	Safe and Stable Families		0.02
	Foster Care and Adoption Assistance		0.277
	Temporary Assistance to Needy Families (TANF)		0.786
		Supplemental Nutrition Assistance Program (SNAP)	1.467
		Family Assistance	0.885
Other [3.791%]	Water Systems and Waste Disposal Systems Grants		0.049
	Appalachian Regional Commission		0.005
	Low Income Home Energy Assistance		0.148
	Refugee and Entrant Assistance		0.013
	Tennessee Valley Authority		0.023
	Department of Veterans Affairs		0.046
		Earned Income Tax Credit (EITC)	2.015
		Income Maintenance Benefits - Excluding Family Assistance	1.492

[#] Percent of aid represents the mean of all Federal Aid and all Transfer Payments to Individuals for all states for all years of this study (1997-2010). Category totals for Federal Aid are in brackets "[…]" in the *Variable of Study* column.

Note 1: Total aid does not add to 100%. Not all Aid from both programs fit into the stated categories. Total aid analyzed amounts to 92.28% of all Federal Aid to States and all Transfer Payments to Individuals.

Note 2: Not all programs span the full range of years of this study.

Note 3: Data for Federal Aid to States comes from Statistical Abstracts, Section 8, http://www.census.gov/prod/www/statistical_abstract.html, while data for Transfer Payments to Individuals comes from Statistical Abstracts, Section 11, http://www.census.gov/prod/www/statistical_abstract.html. For further details on individual variable definitions, please see: https://www.census.gov/govs/school/definitions.html, http://portal.hud.gov/hudportal/HUD, http://www.dol.gov/, and http://www.acf.hhs.gov/.

Table 4. Control Variables

Category	Definition
Age Distribution	Includes two dummy variables: under 15 and over 65. Constant is all ages in between.
Population growth	Change in population
Race Distribution	Vector of percentages of racial breakdown by state
Educational Attainment	Only years available 2009, 2007, 2003, 2000, 1999, 1998, 1997. Includes high school and Bachelors plus
Labor Force Rate	Includes: Men, Women, & Teen
Unemployment Rate	Unemployment ratio for male and female for civilian noninstitutional population, 16 years old and over
Exports	Foreign exports by state of origin, Millions of Dollars
Imports	Foreign imports by state of destination, Millions of Dollars
Initial Debt to GDP	Outstanding debt in 1997 (from State and Local Government Finances) divided by 1997 GDP
Debt to GDP Average	Average of Debt to GDP over all years
Spending to GDP	Ratio of all spending to GDP
Election dummies	For who which party controls governor seat for the year. Constant is Other. Dummy for Republican. Second Dummy for Democrat.
Initial level of the ratio of total social spending to GDP	Total of all social spending from 1997 (from State and Local Government Finances) divided by 1997 GDP
Race	White, Black, Asian, Native American
TopIncomeShares	Values available for top 10, 5, 1, .5, .1 & .01 % of income earners
Electoral: Voting Year	Includes separate variables for Presidential and Congressional voting years. Also, includes cross-section of both.
Electoral: Executive Turnover	Variable with 0 for incumbent still in office and 1 for new governor elected. Number increases for each additional governor to serve in the corresponding year.
Gini Index	Index of dispersion of income distribution. Source: Frank et al. 2015.
Theil Index	Index of distributional entropy of income. Source: Frank et al. 2015.

Table 5. State and Local Government Finances – Prediction of Independent Variables Using GDP

Independent Variable	(1) Education	(2) Employee Retirement	(3) Health	(4) Housing & Community Development	(5) Social Insurance	(6) Unemployment	(7) Veteran Services	(8) Welfare	(9) Workers' Compensation
Adjusted R^2	*0.6161*	*0.4466*	*.2447*	*.5054*	*.2735*	*.5252*	*.2177*	*.4779*	*0.3846*
Of Interest.D.L1	-0.5522 [0.0360]	-0.2681 [0.0360]	-0.2089 [0.0398]	0.1272* [0.0380]	-0.3224 [0.0376]		0.2824 [0.0403]	-0.3011 [0.0446]	
Of Interest.D.L2	0.1852 [0.0451]			-0.1406 [0.0303]	-0.2126 [0.0402]		-0.3271 [0.0402]		-0.4574 [0.0330]
Of Interest.D.L3		0.1225 [0.0324]	-0.1639 [0.0417]	0.1710 [0.0346]	-0.1137* [0.0379]	-0.2950 [0.0579]			-0.0808* [0.0258]
Of Interest^2.D.L1	0.0004 [0.0001]	0.0007 [0.0001]			-0.0037 [0.0006]	-0.0005* [0.0001]	0.0054 [0.0011]	0.0002* [0.0001]	
Of Interest^2.D.L2	-0.0003 [0.0001]	-0.0010 [0.0001]		-0.0011 [0.0001]			-0.0071 [0.0011]		-0.0011 [0.0001]
Of Interest^2.D.L3	0.0002 [0.0000]			0.0002* [0.0001]					-0.0007 [0.0001]
IpC.D								0.0135* [0.0045]	
GDP per Capita.D			0.00636 [0.0011]						
GDP per Capita.D.L1	0.01788 [0.0044]					-0.0272 [0.0023]			
GDP per Capita.D.L2	0.0268 [0.0050]					-0.0006 [0.0024]			
GDP per Capita.D.L3			0.0035* [0.0010]			0.0202 [0.0023]			0.0016** [0.0008]
Unemployment.D									
Unemployment.D.L1						3.2162 [0.8049]			
Unemployment.D.L2						4.2206 [0.7618]			
Unemployment.D.L3						2.3938 [0.6247]		1.3282*** [0.7078]	
Teen Unemployment.D.L2		0.9355** [0.4296]							
Pop Asian.D						29.4793 [7.9288]		25.4626** [10.9006]	

Table 5 cont. State and Local Government Finances – Prediction of Independent Variables Using GDP

Independent Variable	(1) Education	(2) Employee Retirement	(3) Health	(4) Housing & Community Development	(5) Social Insurance	(6) Unemployment	(7) Veteran Services	(8) Welfare	(9) Workers' Compensation
Pop Black.D					-3.3617 [0.9437]				
Pop Black.D.L				-20.7815 [4.5634]					
Pop Native American.D.L1		22.6081** [10.7687]							
Pop Native American.D.L1		-23.3059*** [13.0625]							
Pop Native American.D.L1		-51.7298 [14.4001]							
Pop White.D									
Pop White.D.L1						-9.0296 [0.9423]			
Pop White.D.L2						-2.4679* [0.7874]			
Pop White.D.L3						-4.7884 [0.8804]	-0.1486 [0.0376]		
Pop 35-54.D						-16.6599** [7.3489]		-28.9713*** [14.7749]	
Pop 55-64.D.L1		26.0838 [4.5500]							
Pop 55-64.D.L3							-1.2173 [0.2965]		
Pop 65 Plus.D					4.2117* [1.3471]				
Pop 65 Plus.D.L2			23.5444*** [13.4950]						
Pop Growth Rate					-1.1219 [0.2535]				
PopHSOnly.D	15.2851* [5.189623]								
PopBachPlus.D	23.0431 [5.822224]						-0.2048** [0.0905]		

Table 5 cont. State and Local Government Finances – Prediction of Independent Variables Using GDP

Independent Variable	(1) Education	(2) Employee Retirement	(3) Health	(4) Housing & Community Development	(5) Social Insurance	(6) Unemployment	(7) Veteran Services	(8) Welfare	(9) Workers' Compensation
Spending to GDP.D[#]		861.4779 [100.0864]	655.8933 [82.9215]	982.4824 [141.0865]		844.56 [167.1211]			148.6685** [61.7673]
Spending to GDP.D.L2[#]		661.9227 [130.5992]					21.8462* [7.8908]		
Spending to GDP.D.L3[#]		580.4008 [125.9116]			-63.3903* [24.0938]		28.4879* [8.2812]		
Debt2GDP.D				194.1547 [39.7606]					
Debt2GDP.D.L2	351.1803 [95.4749]		-56.7661** [22.1210]		-16.5180* [5.8045]				
AllRevenueSaL.D			-0.0045 [0.0008]						
Gini.D.L1[#]	-969.5694** [405.3167]								
Gini.D.L3[#]								-769.6697** [338.9082]	
Theil.D					-15.4579 [3.9759]				
Exports.D				23.3756 [3.0312]					
Turnover.L3		11.8224* [3.7353]		9.1826** [3.7327]					
Voting Year Congressional					1.9989* [0.6569]			-41.0885* [13.6723]	
Voting Year Congressional.L3	101.6427 [13.5872]								
Income Shares Top 10.D					0.7551 [0.1817]				
Income Shares Top 10.D.L1				-1.9503* [0.7453]					

[#] The difference of Spending to GDP represents a ratio with a value between -0.04 and 0.05. The difference of the Gini ratio has a value between -0.05 and .13. Even with large coefficients, the total effect is within an expected range.

Note 1: Year fixed effects, if significant, included but not reported.

Note 2: *, **, *** indicate significance at 1%, 5%, and 10%. Default is significant at 0.1%. The values within "[…]" are standard errors.

Note 3: *"of Interest"* represents lags of the columns dependent variable.

Table 6. State and Local Government Finances – Prediction of Independent Variables Using Income/PCE

Independent Variable	(1) Education	(2) Employee Retirement	(3) Health	(4) Housing & Community Development	(5) Social Insurance	(6) Unemployment	(7) Veteran Services	(8) Welfare	(9) Workers' Compensation
Adjusted R^2	*0.6612*	*0.4466*	*0.2170*	*0.5054*	*0.2735*	*0.6184*	*0.2177*	*0.4779*	*0.3877*
Of Interest.D.L1	-0.5732 [0.0412]	-0.2682 [0.0359]	-0.1823 [0.0393]	0.1271* [0.0380]	-0.3224 [0.0376]		0.2824 [0.0403]	-0.3011 [0.0446]	
Of Interest.D.L2	0.1220** [0.0502]			-0.1406 [0.0303]	-0.2126 [0.0401]		-0.3271 [0.0401]		-0.4611 [0.0330]
Of Interest.D.L3		0.1225 [0.0324]	-0.0879** [0.0384]	0.1710 [0.0346]	-0.1137* [0.0379]	-0.2897 [0.0585]			-0.0798* [0.0257]
Of Interest^2.D.L1	0.0003 [0.0001]	0.0007 [0.0001]			-0.0037 [0.0006]	-0.0006 [0.0001]	0.0054 [0.0011]	0.0002* [0.0001]	
Of Interest^2.D.L2	-0.0002* [0.0001]	-0.0010 [0.0001]		-0.0011 [0.0001]			-0.0071 [0.0011]		-0.0011 [0.0001]
Of Interest^2.D.L3	0.0002 [0.0000]			0.0002* [0.0001]					-0.0007 [0.0001]
PCE.D			0.0072 [0.0020]			0.0399 [0.0058]			0.0042* [0.0015]
PCE.D.L1						-0.0421 [0.0069]			
PCE.D.L2	0.0391* [0.0117]					-0.0218* [0.0067]			
PCE.D.L3						0.0307 [0.0059]			
IpC.D						-0.0120* [0.0036]		0.0135* [0.0045]	
IpC.D.L1	0.0219295* [0.0064]					-0.0188 [0.0037]			
IpC.D.L2	0.0205* [0.0078]		0.0041* [0.0015]			0.0121* [0.0039]			
IpC.D.L3			0.0031** [0.0014]			0.0118* [0.0039]			
Unemployment.D						2.2054* [0.7301]			
Unemployment.D.L1						2.7736 [0.6934]			
Unemployment.D.L2						1.5050* [0.5641]			
Unemployment.D.L3								1.3282***	

Table 6 cont. State and Local Government Finances – Prediction of Independent Variables Using Income/PCE

Independent Variable	(1) Education	(2) Employee Retirement	(3) Health	(4) Housing & Community Development	(5) Social Insurance	(6) Unemployment	(7) Veteran Services	(8) Welfare	(9) Workers' Compensation
Teen Unemployment.D.L2		0.9355** [0.4296]							
Pop Asian.D						38.8790 [7.2324]		25.4626** [10.9006]	
Pop Black.D					-3.3617 [0.9437]				
Pop Black.D.L				-20.7815 [4.5634]					
Pop Native American.D.L1		22.6081** [10.7687]							
Pop Native American.D.L1		-23.3059*** [13.0625]							
Pop Native American.D.L1		-51.7298 [14.4000]							
Pop White.D						-7.6401 [0.8568]			
Pop White.D.L1						-3.1831 [0.7165]			
Pop White.D.L2						-4.9518 [0.8200]			
Pop White.D.L3							-0.1486 [0.0376]		
Pop 35-54.D						-25.2205 [6.9634]		-28.9713*** [14.7749]	
Pop 55-64.D.L1		26.0838 [4.5500]							
Pop 55-64.D.L3							-1.2173 [0.2965]		
Pop 65 Plus.D					4.2117* [1.3471]				
Pop 75-84.D			31.0746** [13.0028]						
Pop Growth Rate					-1.1219 [0.2535]				
Pop High School Only.D	10.3650** [4.8241]								

Table 6 cont. State and Local Government Finances – Prediction of Independent Variables Using Income/PCE

Independent Variable	(1) Education	(2) Employee Retirement	(3) Health	(4) Housing & Community Development	(5) Social Insurance	(6) Unemployment	(7) Veteran Services	(8) Welfare	(9) Workers' Compensation
Pop Bach Plus.D	15.8781* [5.3879]						-0.2048** [0.0905]		
Spending to GDP.D	5116.823 [404.9407]	861.4779 [100.0864]	445.0847 [80.3101]	982.4824 [141.0865]		650.5896 [160.9259]			178.4847* [61.2156]
Spending to GDP.D.L1[#]	2414.913 [515.806]								
Spending to GDP.D.L2[#]	-1157.247** [512.3818]	661.9227 [130.5992]					21.8462* [7.8908]		
Spending to GDP.D.L3[#]	-1075.188** [434.0019]	580.4008 [125.9116]			-63.3904* [24.0938]		28.4879* [8.2812]		
Debt to GDP.D				194.1547 [39.7606]					
Debt to GDP.D.L2					-16.5180* [5.8045]				
All State and Local Revenue.D			-0.0043 [0.0009]						
Gini.D.L3[#]								-769.6697** [338.9082]	
Theil.D					-15.4579 [3.9759]				
Exports.D				23.3756 [3.0312]					
Turnover.L3		11.8224* [3.7353]		9.1826** [3.7327]					
Voting Year Congressional					1.9989* [0.6569]			-41.0885* [13.6723]	
Income Shares Top 10.D					0.7551 [0.1817]				
Income Shares Top 10.D.L1				-1.9503* [0.7453]					

[#] The difference of Spending to GDP represents a ratio with a value between -0.04 and 0.05. The difference of the Gini ratio has a value between -0.05 and 0.13. Even with large coefficients, the total effect is within an expected range.

Note 1: Year fixed effects, if significant, included but not reported.

Note 2: *, **, *** indicate significance at 1%, 5%, and 10%. Default is significant at 0.1%. The values within "[…]" are standard errors.

Note 3: *"of Interest"* represents lags of the columns dependent variable.

Note 4: Employee Retirement, Housing & Community Development, Social Insurance, Veteran Services, & Welfare are repeated from Table 5.

Table 7. State and Local Government Finances – Prediction of GDP per Capita

Independent Variable	(1) GDPpC	(2) GDPpC	(3) GDPpC	(4) GDPpC	(5) GDPpC
Adjusted R^2	*0.3507*	*0.3641*	*0.4033*	*0.4216*	*0.7301*
Education Residuals.D.L3	-0.7423*** [0.3995]			-0.827** [0.4054]	
Housing & Community Development Residuals.D.L2		4.5087* [1.3170]		4.4473* [1.3293]	
Housing & Community Development Residuals.D.L3		-2.4874*** [1.3314]			
Workers' Compensation Residuals.D			9.9284* [3.5957]	10.4395* [3.5459]	10.9343*** [5.9314]
Workers' Compensation Residuals.D.L1			14.4193 [3.2749]	14.4115 [3.2246]	
Workers' Compensation Residuals.D.L3			6.1413* [2.0563]	6.3748* [2.0264]	21.1939* [5.9815]
All State and Local Revenue.D					0.5164 [0.0797]
Imports.D.L2					149.7993** [57.3712]
Spending to GDP Ratio.D[#]					-108126.5 [13028.25]
Income Shares Top 10%.D.L					149.6423* [50.2221]

[#] The difference of Spending to GDP represents a ratio with a value between -0.04 and 0.05. Even with large coefficients, the total effect is within an expected range.
Note 1: Year fixed effects included, if significant, but not reported.
Note 2: GDP per Capita lags 1 and 2 included, but not reported.
Note 3: *, **, *** indicate significance at 1%, 5%, and 10%. Default is significant at 0.1%. The values within "[…]" are standard errors.

Table 8. State and Local Government Finances – Prediction of Income per Capita

Independent Variable	(1) IpC	(2) IpC	(3) IpC	(4) IpC	(5) IpC	(6) IpC
Adjusted R^2	*0.4797*	*0.5046*	*.4922*	*0.5279*	*.5488*	*0.6799*
Education Residuals.D.	0.7265* [0.2664]				1.4014* [0.4003]	1.1705*** [0.6072]
Social Insurance Residuals.D.L3		10.1925** [4.9078]			9.7290** [4.8338]	21.4545*** [10.9410]
Unemployment Compensation Residuals.D.L2			-1.6357* [.6332]		-1.7801** [0.6840]	
Workers' Compensation Residuals.D				5.2475** [2.5804]	5.7132** [2.5434]	10.0133** [4.3417]
Workers' Compensation Residuals..D.L1				9.2079 [2.3343]	9.5620 [2.2954]	21.6323 [3.9833]
Workers' Compensation Residuals.D.L3				4.1343* [1.4625]	4.0340* [1.4310]	
Imports.D.L1						-82.0429*** [45.8333]
Spending to GDP.D[#]						-34319.98* [9937.193]
Spending to GDP.D.L3[#]						-22242.83* [8339.637]
Theil						1481.512* [432.7402]
Turnover.L1						-249.8335*** [132.5071]
Unemployment.D.L1						-125.7806*** [65.2087]
Voting Year Congressional						815.8724* [250.4668]

[#] The difference of Spending to GDP represents a ratio with a value between -0.04 and 0.05. Even with large coefficients, the total effect is within an expected range.

Note 1: Year fixed effects included, if significant, but not reported

Note 2: Income per Capita lags 1 and 2 included, but not reported

Note 3: *, **, *** indicate significance at 1%, 5%, and 10%. Default is significant at 0.1%. The values within "[…]" are standard errors.

Table 9. State and Local Government Finances – Prediction of PCE per Capita

Independent Variable	(1) PCEpC	(2) PCEpC	(3) PCEpC	(4) PCEpC	(5) PCEpC	(6) PCEpC	(7) PCEpC	(8) PCEpC
Adjusted R^2	*0.7272*	*0.7253*	*0.7307*	*0.7206*	*0.7326*	*0.7085*	*0.7438*	*0.7973*
Education Residuals.D.	-0.2345*** [0.1371]						-0.3367*** [0.1752]	-0.3104*** [0.1582]
Employee Retirement Residuals.D.L2		-0.8292*** [0.4753]						
Health Residuals.D.L1			0.8908*** [0.5382]				0.9588*** [0.5495]	
Health Residuals.D.L2			1.7635* [0.5350]				1.6695* [0.5368]	1.6751* [0.4790]
Social Insurance Residuals.D				5.5832*** [2.8526]			7.4168* [2.7396]	4.9953** [2.4191]
Social Insurance Residuals.D.L1				-5.1207*** [2.7503]			-5.0105*** [2.6498]	
Social Insurance Residuals.D.L3				7.1040* [2.3680]			6.5999* [2.2779]	7.0823* [2.0214]
Unemployment Compensation Residuals.D					-1.3543 [0.3318]		-1.6404 [0.3258]	-1.3156 [0.2890]
Unemployment Compensation Residuals.D.L2					-0.6112*** [0.3370]		-0.5580 [0.3387]	
Veteran Services Residuals.D						11.7698** [5.8722]	24.6306 [6.9653]	23.5633 [6.3213]
All State and Local Revenue .D								0.0428* [0.0144]
Theil Index.D.L1								3231.897 [450.8065]
Income Shares Top 10%.D								44.8560 [8.3269]
Voting Year Congressional								753.3457 [73.8440]
Pop Asian.D								-190.7788** [86.5403]
Pop Native American,D.L2								292.4115*** [152.6515]
Pop Native American,D.L3								583.8956* [168.8836]
Pop 65 Plus.D.L1								354.8843 [99.2069]

Table 9 cont. State and Local Government Finances – Prediction of PCE per Capita

Independent Variable	(1) PCEpC	(2) PCEpC	(3) PCEpC	(4) PCEpC	(5) PCEpC	(6) PCEpC	(7) PCEpC	(8) PCEpC
Pop High School Only.D								37.9349*** [19.3876]
Pop Bachelors Plus								59.5021* [22.1921]

Note 1: Year fixed effects included, if significant, but not reported.
Note 2: PCE per Capita lags 1 and 3 included, but not reported, for columns 1-7. Only 1 lag include for column 8.
Note 3: *, **, *** indicate significance at 1%, 5%, and 10%. Default is significant at 0.1%. The values within "[…]" are standard errors.

Table 10. Federal Aid & Transfer Payments to Individuals – Prediction of Independent Variables Using GDP

Independent Variable	(1) Family	(2) Health	(3) Housing	(4) Incapacity	(5) Labor	(6) Old Age	(7) Unemployment	(8) Other
Adjusted R^2	*.6931*	*0.6345*	*.7296*	*.4736*	*.8435*	*.9665*	*.8562*	
Of Interest.D.L1	-0.1260* [0.0425]		-0.7562 [0.0320]		0.3040 [0.0542]	0.4024 [0.0654]	0.1948 [0.0223]	
Of Interest.D.L2	-0.150529 [0.0371]		-0.4996 [0.0447]	-0.4615 [0.0374]		0.2154 [0.0373]	-0.2419 [0.0521]	
Of Interest.D.L3			-0.1510 [0.03267]	-0.3253 [0.0469]		0.2711 [0.0387]		
Of Interest^2.D.L1			0.0027 [0.0005]	0.0004** [0.0001]	0.0036 [0.0007]	-0.0008 [0.0002]		
Of Interest^2.D.L2				-0.0012 [0.0001]			-0.0013 [0.0003]	
Of Interest^2.D.L3				-0.0014 [0.0001]				
GDP per Capita.D						-0.0023 [0.0007]	-0.0101 [0.0014]	
GDP per Capita.D.L1	-0.0016*** [0.0010]	0.01181** [0.0046]	0.0010*** [0.0006]	0.0024** [0.0010]	-0.0018 [0.0004]	-0.0018* [0.0006]		
GDP per Capita.D.L2						-0.0020* [0.0007]	0.0050* [0.0015]	
Pop Asian.D			1.8954*** [1.0072]					
Pop Black.D.L							-14.2964** [5.5949]	
Pop White.D.L2	0.8590** [0.3952]							
Pop 17 and Under.D.L2		-29.0549** [11.9262]		-5.6327** [2.6187]				
Pop 18-24.D.L2				-8.6763** [3.8194]				
Pop 65 Plus.D						11.1302** [4.9288]		
Gini.D.L1		2318.686 [495.4408]					468.6107* [143.9617]	
Exports.D							-17.5364 [3.9225]	
Voting Year Congressional					3.0753** [1.3191]			

Table 10 cont. Federal Aid & Transfer Payments to Individuals – Prediction of Independent Variables Using GDP

Independent Variable	(1) Family	(2) Health	(3) Housing	(4) Incapacity	(5) Labor	(6) Old Age	(7) Unemployment	(8) Other
Voting Year Congressional.L3					3.8493* [1.3579]			
Income Shares Top 1.D.L1	-1.2779** [0.6416]							
Income Shares Top 10.D.L1							-3.7414 [0.8253]	

Note 1: Year fixed effects, if significant, included but not reported.
Note 2: *, **, *** indicate significance at 1%, 5%, and 10%. Default is significant at 0.1%. The values within "[…]" are standard errors.
Note 3: *"of Interest"* represents lags of the columns dependent variable.
Note 4: GDP was not significant in predicting Other. Though not duplicated here, the values for Other from Table 11 is utilized for regressions on GDP in Table 12.

Table 11. Federal Aid & Transfer Payments to Individuals – Prediction of Independent Variables Using Income/PCE

Independent Variable	(1) Family	(2) Health	(3) Housing	(4) Incapacity	(5) Labor	(6) Old Age	(7) Unemployment	(8) Other
Adjusted R^2	*.6978*	*0.694*	*.7344*	*.4768*	*.8458*	*.9686*	*.8496*	*.4012*
Of Interest.D.L1			-0.7681 [0.0319]		0.2885 [0.0542]	0.3655 [0.0636]	0.1648 [0.0246]	
Of Interest.D.L2	-0.1287* [0.0373]		-0.5047 [0.0442]	-0.4632 [0.0373]		0.1960 [0.0360]	-0.2503 [0.0532]	
Of Interest.D.L3			-0.1713 [0.0347]	-0.3347 [0.0469]		0.3220 [0.0388]		
Of Interest^2.D.L1			0.0022 [0.0005]	0.0004** [0.0001]	0.0036 [0.0007]	-0.0006* [0.0002]		-0.0009 [0.0002]
Of Interest^2.D.L2				-0.0012 [0.0001]			-0.0016 [0.0004]	
Of Interest^2.D.L3				-0.0014 [0.0001]				
PCE.D					-0.0023** [0.0010]			-0.0118 [0.0033]
PCE.D.L1	-0.0079 [0.0019]	0.0490 [0.0118]	0.0023*** [0.0012]	0.0056* [0.0019]		-0.0064 [0.0018]		
PCE.D.L2							0.0126 [0.0034]	
PCE.D.L3			0.0031** [0.0013]					
IpC.D					-0.00137** [0.0006]		-0.0078 [0.0021]	0.0057* [0.0021]
IpC.D.L1		-0.0200** [0.0077]			-0.0016** [0.0006]	-0.0028** [0.0011]	-0.0078* [0.0024]	
IpC.D.L2						-0.0040 [0.0011]		
Pop Asian.D.L1			2.0139** [0.9992]					
Pop Black.D.L							-21.6041 [5.8744]	11.1970** [5.0498]
Pop White.D.L2	1.1118* [0.4001]							
Pop 17 and Under.D.L2		- [10.9996]		-5.3166** [2.6078]				

Table 11 cont. Federal Aid & Transfer Payments to Individuals – Prediction of Independent Variables Using Income/PCE

Independent Variable	(1) Family	(2) Health	(3) Housing	(4) Incapacity	(5) Labor	(6) Old Age	(7) Unemployment	(8) Other
Pop 18-24.D.L2				-8.9745** [3.8076]				
Pop 65 Plus.D						9.1472*** [4.7548]		
Gini.D.L1[#]		1684.087 [460.5132]					527.2988 [148.8831]	
Exports.D							-17.8209 [4.0552]	
Turnover.L2					-1.8443*** [1.0895]			-7.8499** [3.7111]
Voting Year Presidential		55.7357 [13.0361]						
Voting Year Presidential.L3		70.0572 [12.3261]						
Voting Year Congressional					4.7037* [1.4136]			
Voting Year Congressional.L3					5.8572 [1.5298]			
Income Shares Top 10.D							-3.9734 [0.8669]	

[#] The difference of the Gini ratio has a value between -0.05 and 0.13. Even with large coefficients, the total effect is within an expected range.
The difference of Spending to GDP represents a ratio with a value between -0.04 and 0.05. Even with large coefficients, the total effect is within an expected range.
Note 1: Year fixed effects, if significant, included but not reported.
Note 2: *, **, *** indicate significance at 1%, 5%, and 10%. Default is significant at 0.1%. The values within "[…]" are standard errors.
Note 3: *"of Interest"* represents lags of the columns dependent variable.

Table 12. Federal Aid & Transfer Payments to Individuals – Prediction of GDP per Capita

Independent Variable	(1) GDPpC	(2) GDPpC	(3) GDPpC	(4) GDPpC	(5) GDPpC	(6) GDPpC
Adjusted R^2	*0.3585*	*0.4227*	*0.3683*	*0.37*	*0.4465*	*0.4809*
Housing.D.L3	10.2099* [3.3176]				11.2011** [4.7942]	11.9583** [4.6450]
Labor.D		-12.3572** [4.8259]			-19.7551* [6.6974]	-21.1649* [6.5025]
Old Age.D.L2			-5.5661 [3.3761]			
Unemployment.D.L3				-2.6334*** [1.3584]	-6.5972** [2.5735]	-5.8690** [2.5658]
Gini.D.L1[#]						-19210.65 [4784.109]
Income Shares Top 10.D.L1						137.7153 [31.3337]
Voting Year Congressional						719.1446 [105.1779]
Voting Year Congressional.L3						824.4604 [162.0569]

[#] The difference of the Gini ratio has a value between -0.05 and 0.13. Even with large coefficients, the total effect is within an expected range.

Note 1: Year fixed effects included, if significant, but not reported.

Note 2: GDP per Capita lags 1 and 2 included, but not reported, for columns 1-7. Only 2nd lag included for column 8.

Note 3: *, **, *** indicate significance at 1%, 5%, and 10%. Default is significant at 0.1%. The values within "[…]" are standard errors.

Table 13. Federal Aid & Transfer Payments to Individuals – Prediction of Income per Capita

Independent Variable	(1) IpC	(2) IpC	(3) IpC	(4) IpC	(5) IpC	(6) IpC	(7) IpC	(8) IpC
Adjusted R^2	*0.4605*	*0.5101*	*0.4345*	*0.4903*	*0.486*	*.4607*	*0.4985*	*0.5418*
Family Residuals.D.L1	-2.2303*** [1.2910]							
Housing Residuals.D.L3		8.2238 [2.3761]					10.2738* [3.4805]	12.6504 [3.4005]
Incapacity Residuals.D			2.3035*** [1.2175]				4.4220** [2.0359]	3.6902*** [1.9548]
Labor Residuals.D.L3				-8.0356** [3.7130]			-11.4013** [5.1267]	-10.9633** [4.9152]
Unemployment Residuals.D.L2					-2.0717** [0.9385]			
Other Residuals.D.L1						1.7489*** [0.9777]		
Pop 17 and Under.D.L2								313.4193* [93.3626]
Pop 18-24.D.L2								327.1763** [156.843]
Voting Year Congressional								439.3321 [115.6658]
Income Shares Top 10.D								93.4253 [23.6831]

Note 1: Year fixed effects included, if significant, but not reported.
Note 2: Income per Capita lags 1 and 2 included, but not reported.
Note 3: *, **, *** indicate significance at 1%, 5%, and 10%. Default is significant at 0.1%. The values within "[…]" are standard errors.

Table 14. Federal Aid & Transfer Payments to Individuals – Prediction of PCE per Capita

Independent Variable	(1) PCEpC	(2) PCEpC	(3) PCEpC	(4) PCEpC	(5) PCEpC	(6) PCEpC	(7) PCEpC	(8) PCEpC
Adjusted R^2	*0.7236*	*0.7269*	*0.7282*	*0.7265*	*0.7275*	*0.7108*	*0.7368*	*0.759*
Health Residuals.D.L3		-0.3637** [0.1503]					-0.3107*** [0.1661]	-0.3309** [0.1598]
Labor Residuals.D.L3			-5.5054* [1.9195]				-6.6031* [2.2085]	-6.6803* [2.1146]
Old Age Residuals.D.L1				-2.2580*** [1.2006]				
Unemployment Residuals.D.L2					-0.8291*** [0.4552]		-0.9425*** [0.4948]	-1.0486** [0.4817]
Other Residuals.D.L1						1.7349* [0.5145]	1.4138* [0.5224]	1.3521* [0.5012]
Pop Black.D.L								200.3102* [65.2417]
Exports.D								144.1453 [38.0712]
Voting Year Presidential								-863.5265 [52.2570]
Voting Year								316.9802 [56.2301]
Income Shares Top 10.D								70.3423 [10.0792]

Note 1: Year fixed effects included, if significant, but not reported.
Note 2: PCE per Capita lags 1 and 3 included, but not reported, for columns 1-7. Only 1 lag include for column 8.
Note 3: *, **, *** indicate significance at 1%, 5%, and 10%. Default is significant at 0.1%. The values within "[…]" are standard errors.

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