Tulane Economics Working Paper Series

Giver and Taker States Over the Business Cycle

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Working Paper 2001
May 2020

Abstract

Some states pay more in federal taxes than they receive in federal spending and have a negative balance of payments. While this uneven pattern of spending and taxation has been known for some time, little attention has been paid to the cyclical effects of these spending–tax differentials. Intuitively, "giver" states, those that pay more in taxes than they receive might have an extra cyclical buffer in the face of an economic downturn, as their balance of payments to the federal government may improve more than for "taker" states, those that receive more than they pay. In this study, we test the hypothesis of whether the giver status itself works as a potential stabilization mechanism during economic fluctuations. We use difference-in-differences methods to estimate the effect of giver status on the response of a state's balance of payments during and after a recession. The Great Recession in 2008 serves as the exogenous shock in our identification strategy. To estimate the relationship between a state's balance of payments and its gross domestic product growth, we take an instrumental variables approach. We use the variation in the response of federal fiscal measures to a recession that is attributable to giver status to estimate the effect of a state's balance of payments on gross state product growth. The results from our difference-in-differences analysis indicate that after the 2008 recession, per capita balance of payments in giver states improved $808 more on average compared to taker states. The point estimates from our instrumental variable specification suggest that a thousand-dollar improvement in balance of payments increases the annual growth in gross domestic product by 2.2 percentage points. We also explore the milder 2001 recession. Although tax receipts of giver states fall more than taker states during the recession, spending also falls in these states relative to the taker states. The increase in defense and international spending after the 9/11 crisis most likely explains these results.

Keywords: Giver and taker states, Fiscal balances, Stabilization.
JEL codes: H72, E62.

Giver and Taker States over the Business Cycle

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Version: May, 2020

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Abstract

Some states pay more in federal taxes than they receive in federal spending and have a negative balance of payments. While this uneven pattern of spending and taxation has been known for some time, little attention has been paid to the cyclical effects of these spending–tax differentials. Intuitively, "giver" states, those that pay more in taxes than they receive might have an extra cyclical buffer in the face of an economic downturn, as their balance of payments to the federal government may improve more than for "taker" states, those that receive more than they pay.

In this study, we test the hypothesis of whether the giver status itself works as a potential stabilization mechanism during economic fluctuations. We use difference-in-differences methods to estimate the effect of giver status on the response of a state's balance of payments during and after a recession. The Great Recession in 2008 serves as the exogenous shock in our identification strategy. To estimate the relationship between a state's balance of payments and its gross domestic product growth, we take an instrumental variables approach. We use the variation in the response of federal fiscal measures to a recession that is attributable to giver status to estimate the effect of a state's balance of payments on gross state product growth.

The results from our difference-in-differences analysis indicate that after the 2008 recession, per capita balance of payments in giver states improved $808 more on average compared to taker states. The point estimates from our instrumental variable specification suggest that a thousand-dollar improvement in balance of payments increases the annual growth in gross domestic product by 2.2 percentage points.

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1 Introduction

The limitation on the state and local tax deduction in the Tax Cuts and Job Act and its uneven impact on the states directed attention to the fact that states differ in the amount of tax revenues they send to and spending they receive from the Federal Government.[1] Some states pay more in federal taxes than they receive in federal spending and have a negative balance of payments. These states are sometimes referred to as "giver" states. A "taker" state then is one that receives more in federal spending than it pays in federal taxes.[2]

Schultz and Cummings (2019) document these discrepancies in federal spending received and federal taxes paid by states with a special focus on New York: a long-time giver state with one of the least favorable per capita balance of payments.[3] This is not a new observation. Several decades ago, former United States Senator Daniel Moynihan drew attention to the unequal distribution of federal tax receipts and spending among states. In his annual report called the "Fisc", he emphasized the unfavorable position of New York and the adverse effects of this "unfair burden" on the state's economic activity.

[1] In 2014, the average of total federal taxes per capita paid was $8,223; ranging from $3,390 (Mississippi) to $18,740 (Delaware). In the same year, the average of total federal spending per capita received was $9,665; ranging from $6,732 (Utah) to $15,118 (Virginia).

[2] The words "donor" and "donee" are also used to categorize states according to their Federal balance of payments.

[3] In 2014, New York's per capita balance of payments was - $2,263; while the national average was $1,441.

While this uneven pattern of spending and taxation has been known for some time, little attention has been paid to the cyclical effects of these spending-tax differentials. Intuitively, giver states might have an extra cyclical buffer in the face of an economic downturn, as their balance of payments to the federal government may improve more than for taker states. For example, tax payments which are relatively higher in giver states may decrease more than in taker states.

In this study, we explore whether the giver status itself works as a potential stabilization mechanism during economic fluctuations. We offer two contributions to the literature. First, we show how being a giver state can affect the way federal spending and tax revenues respond to a recession. Second, we document how the part of this response that is attributable to the giver status serves as a stabilizer of economic activity. Our primary focus in this paper is the Great Recession beginning in 2008, although we do consider the milder 2001 recession as well.

Our analysis requires using the geographic distribution of Federal tax receipts and spending. We use Internal Revenue Service's Data Books for gross collections by type of tax and state. For the Great Recession, federal spending data at the state level comes from the The Pew Charitable Trusts (2016). Pew re-created U.S. Census Bureau's Consolidated Federal Funds Report, which was discontinued after 2012. The status of a state, i.e. whether it is a giver or a taker state, is determined by its balance of Federal tax receipts and spending at the beginning of the sample period.

We use difference-in-differences methods to estimate the effect of giver status on the response of a state's balance of payments during and after a recession. The 2008 Great Recession serves as the exogenous shock in our identification strategy. We conduct an event study to see whether giver and taker states exhibit similar trends in terms of federal fiscal measures before the Great Recession. The event study also shows how these fiscal measures evolve differently for giver and taker states during the recovery period.

After establishing the link between a state's giver status and the response of its balance of payments to a recession, we turn to the relationship between a state's balance of payments and its gross domestic product growth. Estimating a causal link between a state's balance of payments and gross domestic product is challenging since the direction of causality is unclear. For example, an increase in the state's economic activity may worsen its balance of payments by increasing the amount of federal taxes paid while limiting the amount of federal spending received. On the other hand, an improvement in a state's balance of payments may stimulate economic activity and enable higher growth in gross domestic product.

We overcome this challenge by taking an instrumental variables approach. In the first stage, we extract the variation in the response of federal fiscal measures to a recession that is attributable to giver status. Then, in the second stage, we use this variation to estimate the effect of a state's balance of payments on gross state product growth. Our identifying assumption is that giver status of a state affects its economic activity only through the

balance of Federal tax receipts and spending.

Following the 2008 Great Recession, the balance of Federal tax receipts and spending improved for almost all of the states.[4] This overall improvement was mainly due to the slowdown in economic activity and also economic policies such as the Economic Stimulus Act of 2008 and the American Recovery and Reinvestment Act of 2009. The results from our difference in differences analysis indicate that the magnitude of this improvement varied between giver and taker states. After the Great Recession, per capita balance of payments in giver states improved $808 more on average compared to taker states. The largest portion of this difference ($574) came from a decrease in Federal tax receipts. The change in per capita Federal spending was also different between giver and taker states. The increase in per capita Federal spending received by giver states exceeded the increase in taker states by $234 on average.

Giver states were affected less by the 2008 Great Recession compared to taker states. The decline in the gross domestic product in 2009 was about 3 percent less among giver states, which is suggestive that giver status has worked as a buffer and mitigated the adverse effects of the Great Recession. The results confirm our hypothesis of giver status being another layer of stabilization through an improvement in the state's balance of payments. The point estimates from our instrumental variable specification indicate

[4]Louisiana is the only state that has a worse balance of payments per capita in 2009 ($3,684) compared to 2005 ($3,809).

that a thousand-dollar improvement in balance of payments increased the annual growth in gross domestic product by 2.3 percentage points. In short, being a giver state had a favorable impact on economic activity through the Great Recession.

We also analyzed the milder 2001 recession. Here we found that, relative to taker states, tax receipts in giver states fell during this period, but spending in giver states also fell, contrary to our results for the Great Recession. As a result, overall fiscal balances did not change. We attribute this to the sharp increase in defense and international spending following 9/11.

2 Background

The 2008 Great Recession and the following decline in economic activity brought fiscal policy back on the table as an instrument to stabilize aggregate output (Fatas and Mihov, 2012; Feldstein, 2009). This change has also spread to academic research and lead to "a revival of interest in fiscal policy in macroeconomics" (McKay and Reis, 2016). Ramey (2019) provides an overall assessment of recent research on fiscal policy.

The literature mainly focuses on two dimensions of fiscal policy as a tool of stabilization. First, is the manner in which it is conducted, for example, whether through automatic stabilizers or discretionary policies; and, second, are the instruments it uses, for example, revenues or expenditures. The specific type of the instrument, such as whether the expenditure is a social

transfer or a government purchase, or whether the revenue is collected as a personal income tax or corporate income tax, also appears to be an important dimension of a policy's effectiveness.

In recent research, McKay and Reis (2016) find that automatic stabilizers overall played a minor role in the U.S. business cycle; however, redistribution and social insurance channels and programs that rely on them such as food stamps are effective in reducing the fluctuations in aggregate output. Oh and Reis (2012) focus on the large discretionary increase in social transfers –mainly led by the increases in retirement spending, medical care transfers and income assistance– as a response to the Great Recession and emphasize their contribution in restoring output and employment. Wilson (2012) estimates the effect of federal stimulus funds from the American Recovery and Reinvestment Act (ARRA) of 2009 on employment by using state-level allocations. He finds that ARRA created about eight jobs per million dollar spent in its first year.

Auerbach and Feenberg (2000) find that automatic stabilization mainly occur through tax-induced consumption responses and offset as much as 8 percent of the initial shocks to aggregate output. The authors also find that the share of taxes in the economy determines their ability to work as automatic stabilizers, that is, the larger their share the more they are able to act as automatic stabilizers. This finding is consistent with the notion of "built-in flexibility" of the tax system suggested by Pechman (1973).

Fatas and Mihov (2012) come to a similar conclusion that the size of

the government determines the strength of automatic stabilizers in OECD economies. Dolls et al. (2012) also document the heterogeneity in the way automatic stabilizers respond to economic fluctuations within the European Union. The authors explain the presence of weaker automatic stabilizers with the relatively smaller size of the public sector.

The structure of the economic system and more specifically the size and the regulation of the public sector also seems to affect the way automatic stabilizers operate during business cycles. Poterba (1994) uses the variation in fiscal flexibility across U.S. states to study how state taxes and expenditures respond to financial shocks. He finds that states with relatively tight fiscal rules fail to make rapid fiscal adjustments and states in which one party controls both the governorship and the lower house in the legislature are more likely to respond quickly.

We aim to address a similar question posed by Poterba (1994), though our study differs in two ways. First; instead of the fiscal institutions and political factors, we would like to investigate how the federal balance of payments, that is whether the state is a giver or taker state, affects a state's response to a financial shock. Second, our measure of fiscal response is the changes in federal taxes and expenditures instead of changes in state taxes and expenditures.

Hines (2010) shows that federal tax revenues and spending are more sensitive to economic fluctuations as compared to states' tax revenues and spending. This countercyclical pattern of federal fiscal measures, along with

their relatively large share in a state's economy[5] make them a strong candidate as an instrument to stabilize economic activity. Asdrubali et al. (1996) find that 13 percent of shocks to gross state product are smoothed by federal government, through smoothing in disposable income, while 39 percent of smoothing takes place in capital markets and credit markets smooth 23 percent of shocks. However, their study assumes that gross state product in each state is exogenous and they thus only examine the role of federal taxes and transfers through their effects on state disposable income and do not explore the feedback effects on gross state product.

As we discussed in the introduction, virtually all of the literature on states' balance of payments with the federal government has centered around the question of "fairness".[6] From a normative point of view, it is not clear why this should be a focus if our concern is on individual welfare. Certainly in a progressive tax and transfer system, we do not expect individual households to be in balance with the federal government. We expect higher income individuals to be in an overall deficit even if the federal budget is balanced. As states differ in the economic profile of their residents, for similar reasons we would expect them to have legitimate deficits or surpluses with the federal government. On the other hand, for certain types of government spending, such as on infrastructure, there may be a legitimate case for detailed rules

[5]Between 2005 and 2014, the share of federal tax receipts and spending in a state's gross domestic product on average were 16 and 21 percent.

[6]In a New York Times article, Krugman (2019) discusses how the unequal distribution of federal taxes and spending is used in political arguments.

specifying equitable allocations across the states (Zhu and Brown, 2013).

In this study, we are not interested in how "fair" federal taxes and spending are distributed among states or the potential political consequences of this distribution. We are interested in how changes in the existing distribution affects states' economic outcomes in the case of an economic shock. Our hypothesis follows a simple logic. A state is a giver state because federal taxes it pays exceed federal spending it receives. This might happen because of a relatively high level of federal tax receipts or a relatively low level of federal funds. In either case, this gives federal fiscal measures more room to work as an automatic stabilizer in case of a macroeconomic financial shock affecting aggregate demand and output.

3 Data and Empirical Strategy

3.1 Data Sources

The data on Federal taxes and spending by state come from three sources: The Internal Revenue Service, the Pew Charitable Trusts, and the Consolidated Federal Funds report. Using these data, we calculate each state's Federal balance of payments and its giver/taker status.

The Internal Revenue Service publishes annual Data Books to describe its activities such as revenue collection, tax refunds, law enforcement, taxpayer assistance, budget and workforce on a fiscal year basis. Federal taxes paid by each state are reported in these annual Data Books (Internal Rev-

enue Service, 2005-2014). Table 1 displays the breakdown of total Internal Revenue collections in fiscal year 2014 by type of tax. A significant portion of Federal Tax revenues comes from Individual Income Taxes. Individual income taxes along with their associated insurance contributions constitute 84 percent of the total revenue collections. The classification of the business income tax by state is based on the location of the principal office or place of business. Also, the profits or losses of partnerships, S corporations, regulated investment companies, and real estate investment trusts are included in the owners' individual income tax returns and are not shown as business income tax.

The Consolidated Federal Funds Report, published by the U.S. Census Bureau, had been the main source of information on the geographic distribution of Federal spending across states (U.S. Census Bureau, U.S. Department of Commerce). However, the Bureau decided to discontinue the Report in 2012, after the publication of fiscal year 2010. The Pew Charitable Trusts, motivated by the wide use of these reports among analysts and policy makers, re-created the Bureau's analysis and produced a data set containing Federal spending by state from 2005 to 2014. We use the Pew data for our analysis of the Great Recession. When we turn to the 2001 recession, we use the Consolidated Federal Funds Report.

Similar to the Bureau's Report, Pew divides Federal spending into five major categories: Retirement Benefits, Non-retirement Benefits, Grants, Contracts, and Salaries and Wages. Retirement benefits are payments to

individuals including Social Security retirement, survivor and disability payments; veterans' benefits; and other federal retirement and disability payments. Non-retirement benefits include Medicare benefits, food assistance, unemployment insurance payments, student financial aid and other assistance payments. Grants include funds to state and local governments for programs such as health care (mainly Medicaid), transportation, education and housing and also cover research grants. Contracts include government purchases of good and services. The Salaries and Wages category captures payments to federal employees. Table 2 presents the amounts for fiscal year 2014. Retirement and Non-retirement benefits constitute slightly more than half of the total Federal Spending in fiscal year 2014.

Gross domestic product data on state level, Gross State Product (GSP) hereafter, comes from the U.S. Bureau of Economic Analysis. We normalize GSP and fiscal measures to 2009 dollars and use population data by state from the U.S. Census Bureau to calculate per capita figures. Our unit of analysis is state by year. For our analysis of the Great Recession, we have, we have ten years and 50 states, which implies 500 state-by-year observations for any given outcome variable. This period captures the 2008 Great Recession and leaves us with four years of the pre-recession period, 2005 to 2008; and six years of the post-recession period.

3.2 Giver vs. Taker States

We classify states as being giver or taker according to their Federal balance of payments in fiscal year 2005. We take 2005 giver/taker status of a state constant throughout the sample period, although the status for many states change after the 2008 Great Recession. We would like to see how the fiscal measures of a *typical* giver state behave during an economic downturn. Table 3 presents Federal balance of payments for states in fiscal years 2005, 2009, and 2014. In 2005, 20 out of 50 states have a negative Federal balance of payments and are categorized as giver states. The number of giver states decreases to 7 in 2009 after the 2008 Great Recession. This decrease was mainly due to a substantial decrease in Federal tax payments and increase in Federal spending via economic policies such as the Economic Stimulus Act of 2008 and the American Recovery and Reinvestment Act of 2009. Oklahoma, Michigan, Nevada, Connecticut, and Delaware — all giver states in 2005 — were the top five states with the largest improvement in their Federal balance of payments. The number of giver states rebounds back to 17 in 2014 as the economy recovers from the recession, however, it does not reach its 2005 level, implying that for some states the improvement in Federal balance of payments is long-lasting. Figure 1 displays how the number of giver states change over our sample period. Despite the changes in the status of being giver or taker, the rankings seem to be quite stable throughout time. For example, 8 out of the 10 top taker states in 2005 are still in the top 10 taker states in 2009 and 2014.

Table 4 presents the sample means by giver/taker status before and after the 2008 Great Recession. The per capita GSP is about $5,000 higher in giver states on average. The yearly GSP growth in giver states seems to have increased after the recession, while the opposite is true for taker states. There is an improvement in per capita Federal balance of payments for both giver and taker states after the recession. The improvement in the Federal balance of payments, on average, is higher for giver states ($2,539) compared to taker states ($1,730). The increase in Federal spending after the recession is relatively similar for giver and taker states ($1,462 vs $1,219), but the decrease in Federal tax receipts in giver states is more than double the decrease in taker states ($1,086 vs $511).

3.3 Empirical Strategy

We start by comparing the fiscal measures of giver and taker states before and after the 2008 Great Recession in a difference-indifferences setup to explore how the effect of the recession on Federal balance of payments differs between giver and taker states. Then, we estimate the effect of the adjustments in Federal fiscal measures on economic activity by using an instrumental variable approach.

3.3.1 Difference-in-Differences

Our difference-in-differences specification takes the following form;

$$Y_{st} = \alpha + \beta(Giver_s \times PostRec_t) + \gamma_s + \delta_t + \epsilon_{st}. \quad (1)$$

The outcome variable, Y_{st}, represents a fiscal measure such as total business income taxes paid by state s at year t. The binary variable $Giver_s$ turns on if the Federal balance of payments of state s is negative at the beginning of our sample period, which is 2005. Another binary variable, $PostRec_t$ is equal to one during 2009 and onwards. The coefficient of interest is β, capturing the effect of being a giver state on the given fiscal measure during and after the 2008 Great Recession. The level differences between states are captured by state fixed effects, γ_s, and temporal changes that might affect both giver and taker states are captured by time fixed effects, δ_t[7]. We cluster robust standard errors by state level.

We also conduct an event study to check the parallel trends assumption and explore how the effect evolves over time, during recovery period from the recession. Our estimating equation follows;

$$Y_{st} = \alpha + \sum_{t=2005}^{2014} \beta_t \big(Giver_s \times \boldsymbol{I}(Year = t)\big) + \gamma_s + \nu_{st} \quad (2)$$

The event study estimates the effect of being a giver states on the given fiscal measure for each year separately given by β_t. The binary variable $\boldsymbol{I}(Year = t)\big)$ turns on if the observation belongs to year t. The excluded year is 2008. The event study enables us to test whether fiscal measures

[7]We also control for lagged growth rates when the growth rate is used as an outcome variable

of giver and taker states follow a parallel trend before the recession, i.e. during 2005 to 2007. It also reveals the persistence of the effect of the Great Recession on the fiscal measures for giver and taker states.

3.3.2 Instrumental Variable

We are interested to see whether the giver status equips a state with an additional layer of stabilization mechanism through its effect on the Federal balance of payments during an economic downturn. First, we compare yearly percentage growth in GSP of giver and take states before and after the 2008 Great Recession in a difference-in-differences setup. This comparison establishes the difference in the way the recession affects economic activity in giver and taker states, in other words, whether the giver status contributes to the stabilization of aggregate output. Next, we investigate the role of federal fiscal measures in the process of stabilization. This requires estimating the effect of a change in a state's Federal balance of payments on the growth rate of its GSP.

However the direction of causality between a state's GSP and its Federal balance of payments is unclear. A declining GSP is likely to improve a state's Federal balance of payments through declining tax payments and rising Federal spending; while an improvement in Federal balance of payments may stimulate economic activity and lead to higher growth in GSP.

We address the simultaneity between economic activity and Federal balance of payments by taking an instrumental variable approach. The het-

erogeneity in the way giver and taker states respond to the Great Recession enables us to tease out the effect of a change in Federal balance of payments on the state's GSP during an economic downturn. Our instrument is an indicator variable that turns on if the state is a giver state (in 2005) and the period is post-recession (from 2009 onwards). In the first stage of the instrumental variable approach, we extract the variation in the response of federal fiscal measures to a recession that is attributable to giver status. Then, in the second stage, we use this variation to estimate the effect of a state's Federal balance of payments on GSP growth. Our identifying assumption is that the causation from the giver status to the differential effect of the recession on the economic activity between giver and taker states runs only through the differential effect of the recession on the Federal balance of payments.[8]

Our first stage equation is the same as our difference-in-differences specification given by Equation 1. The structural equation in the second stage then follows;

$$G_{st} = \alpha + \beta \widehat{Y_{st}} + \gamma_s + \delta_t + \phi G_{st-1} + \eta_{st} \tag{3}$$

The variable G_{st} represents yearly percentage GSP growth of state s in year t. The fitted value of the given fiscal measure from the first-stage

[8]Any other channel, which causes the effect of the recession on economic activity to be different between giver and taker states, such as an inherent resilience to financial shocks, would bias our results upwards. We believe that the difference in the response of federal fiscal measures between giver and taker states is the largest and most important channel, if not the only one, explaining the difference in the effect of the recession on economic activity.

equation is given by $\widehat{Y_{st}}$. We use state and time fixed effects, γ_s and δ_t, to control fixed differences between giver and taker states, and temporal shocks that might affect both. The lagged growth rate G_{st-1} accounts for a possible autocorrelation in the growth rate of GSP. Robust standard errors are clustered at the state level.

4 Results

Table 5 displays the point estimates for the coefficient β in Equation 1. These estimates represent how the effect of the 2008 Great Recession on Federal fiscal measures differs for giver states compared to taker states. After the recession, Federal balance of payments improved for both giver and taker state as a consequence of decreasing Federal tax payments and increasing Federal spending. However, our point estimate implies that this improvement was on average $808 higher for giver states. The largest portion of this difference ($575) comes from a relatively higher decline in Federal taxes paid by giver states. Also, the Federal spending received by giver states increased $234 more than taker states on average after the recession.

The decrease in individual income and employment taxes paid by giver states was $242 more than taker states, though the point estimate is not precisely estimated. The point estimate on the business incomes taxes points to a $300 decrease and is significant at 1 percent level. On the spending side, we find a statistically significant and economically meaningful increase in the

contracts for purchases of goods and services for giver states, exceeding the amount for taker states by $125. These point estimates seem to be robust to the inclusion of the state specific linear time trends (Appendix - Table A1).

Figure 2 presents the results of our event study analysis for Federal balance of payments, Federal taxes paid and Federal spending received. The event study takes the difference in the fiscal measure of interest between giver and taker states for each year and compares to the difference in 2008. The point estimates for pre-recession years, 2005 to 2007, are not distinguishable from zero implying that pre-recession trend in fiscal measures conforms to the parallel trends assumption. After the Great Recession, starting from 2009, the parallel trends start to diverge in favor of giver states. Figure 2.A displays the point estimates for Federal balance of payments. The improvement in per capita Federal balance of payments among giver states exceeds giver states by $1,120 in 2009. This difference persists during the whole sample period, although the point estimates are declining and become less precise towards the end.

Figure 2.B and Figure 2.C present the results for taxes and spending separately. The decline in Federal taxes paid by giver states right after the recession is significantly —both statistically and economically— higher (around $1,100) than taker states. This difference becomes smaller and statistically insignificant towards the end of the sample period. The break-down of federal taxes into sub-categories, presented in Panels B and C of Figure 3, implies that both individual income taxes and business income taxes are

responsible for the initial decline in Federal taxes paid by giver states.

Figure 2.C displays the opposite pattern for Federal spending received. The difference between giver and taker states in terms of the Federal spending is not distinguishable from zero during years following the recession, however, increases in favor of the giver states towards the end of our sample period.[9] One possible explanation for this pattern is the delayed response in discretionary fiscal policy through Federal contracts and grants, as seen in Panel C and D of Figure 4. On the other hand, Figure 4.B shows that the increase in non-retirement benefits in giver states exceeds the increase in taker states immediately after the recession. This is not surprising, since non-retirement benefits are more likely to act as an automatic stabilizers, through increased eligibility for food and income assistance and unemployment insurance, and is also in line with our hypothesis that automatic stabilizers work more effectively in giver states compared to taker states.

In addition to fiscal measures, we use the yearly growth rate in GSP as an outcome variable in our difference-in-differences specification to explore how the effect of the recession on aggregate output differs between giver and taker states. Table 6 displays that GSP growth in giver states is 1.96 percentage points higher compared to taker states during the years following the Great Recession, implying that giver states experienced a smaller drop and recovered faster. The coefficient on the lagged growth rate is 0.12 percent-

[9]The actual allocation of grants are also likely to be motivated by political factors (Gimpel et al., 2012).

age points, suggesting a modest autocorrelation in the growth rate. Figure 5 shows that this difference in growth rates is increasing over time reaching almost 3.5 percentage points in 2014.

Table 7 presents the result from the instrumental variable specification, where we attribute the difference in the growth rate in GSP to the adjustment in Federal balance of payments. As a comparison, we start by regressing yearly growth rate in GSP on Federal balance of payments using ordinary least squares. The point estimate, displayed in the second column, is 0.17 percentage points and is not statistically significant. This result suggest that yearly growth rate of a state's GSP is not correlated with the its Federal balance of payments.

Next, we use the adjustment in the Federal balance of payments after the Great Recession that is attributable to the giver status to estimate the effect of an improvement in the Federal balance of payments on yearly growth rate of GSP. The third column displays this instrumental variable estimate and implies that a $1000 improvement in balance of payments increases the yearly growth rate of GSP by 2.25 percentage points. The coefficient on the lagged growth rate is very small (0.17 percentage points) and also not statistically significant. The third row of the table presents the first stage result, that is, the response in Federal balance of payments to the recession that is attributable to the giver status. The magnitude of this response is $808, which is the same point estimate as in our difference-in-differences specification. The F statistics is 127.21 and verifies the strength of our instrumental

variable.

5 Robustness Checks

Our main results imply that the giver status contributes to the stabilization of a state's economic activity during a business cycle through a relatively larger improvement in its Federal balance of payments. We would like to make sure that our empirical analysis does not pick up an inherent resilience of "rich" states to an economic downturn. To test this, we rank states according to their per capita gross state product (GSP) in 2005 and separate them into quartiles, such that the first quartile consists of the "richest" states. Then, we estimate the following equation;

$$G_{st} = \alpha + \sum_{q=1}^{4} \beta_q \big(Quarter_q \times PostRec_t \big) + \gamma_s + \delta_t + \phi G_{st-1} + \kappa_{st}. \qquad (4)$$

The dependent variable G_{st} represents the yearly percentage change in growth state product (GSP). The variable $Quarter_q$ indicates the quartile that the state is assigned to according to its per capita GSP in 2005. As before, γ_s and δ_t represent state and time fixed effects and κ_{st} is the error term. The lagged growth rate G_{st-1} accounts for a possible autocorrelation in the growth rate of GSP. The excluded quarter is the fourth quarter, which consists of the "poorest" states. The coefficient β_1 represents the difference

in GSP growth between "richest" and "poorest" states, before and after the recession. A positive, economically meaningful, and statistically significant β_1 implies that "rich" states perform better during an economic downturn. The first row of Table 8 displays the results. We find β_1 to be -1.21 and not statistically significant.

Next, we rank states according to their Federal balance of payments in 2005 and separate them into quartiles, such that the first quartile consists of "top giver" states, that is, states with the largest negative balance of payments. Based on these rankings, the coefficient β_1 now represents the difference in GSP growth between "top giver" and "top taker" states, before and after the recession. A positive, economically meaningful, and statistically significant β_1 implies that giver states perform better during an economic downturn. This time, as shown in the second row of Table 8, we find β_1 to be 2.11 and statistically significant at 5 percent level, which strengthens our confidence in the main results and the argument that the giver status of a state works as a potential stabilization mechanism during economic fluctuations.

The third and fourth rows of Table 8 display the point estimates with state rankings based on total Federal taxes paid and total Federal spending received. In both rows, the coefficients for the first quartiles ("biggest payers" and "lowest receivers") are positive and statistically significant implying that the variation in the magnitude of fiscal measures across states matters during business cycles.

6 2001 Recession

We now apply the methods developed in the previous sections to the 2001 recession. This recession was much milder than the Great Recession. It lasted from only March to November and during this period quarterly GDP growth rates from the previous quarter at annual rates fell a maximum of -1.7 percent in the third quarter and were preceded and followed by positive growth rates in GDP. Measuring GDP growth from the same quarter one year ago, real GDP did not fall at all during 2001. Thus, this was a very mild recession by historical standards.

We analyzed the period from 1998 to 2004 using the Federal Consolidated Federal Funds Report. These are essentially the same as the Pew report except the Census uses the term "Procurement" as opposed to "Contract". We use the same difference-in-differences methods; for our event studies we use 2000 as our base year. Table 9 provides our estimates for the effects on giver states balances, taxes, and spending as well as for components of spending and taxes. Although the recession was mild, our analysis turned up interesting and significant results.

Our key finding is that, relative to taker states, total taxes fell for giver states by $384 per-capita but that spending in giver states fell by $482 dollars and both these total effects were statistically significant. As a result of these offsetting effects there was little impact on total balances which were not statistically significant. Compared to the Great Recession, taxes did fall in

both cases, but in 2001 spending in giver states fell. Since balances were not significantly impacted, there were no statistically different impacts on economic growth between the states.

Why did spending differ in this recession? From Table 9, we see the main drivers in differences in spending between giver and taker states were in the categories of procurement and grants which together account for about 75 percent of the total difference in spending. While retirement spending is by far the largest category, movements in procurement and grants accounted for a much more important share of the differences in spending. But why were procurement and grants so important here?

From 2000 to 2004 there was a significant increase in discretionary spending from 6.3 to 7.7 percent of GDP. This is unusual as discretionary spending as a share of GDP fell sharply throughout the 1990s. This 1.4 percentage point change was the same as the total change in discretionary spending as a share of GDP (Congressional Budget Office, January 2005). On closer examination, defense and international spending increased over this period by 1.0 percentage point. Historically, this is largely the consequence of a rapid change in spending priorities after 9/11. Unlike the 2009 recession where spending increases in the ARRA were designed to stimulate the economy, here the reason for the spending increase was an external political development. Moreover, historically taker states (often in the South and West) were the recipients of defense spending and this pattern presumably continued over this period.

Our event study graphs also show that procurement and grants started to increase after 2001 and continued to increase for several years. We had previously noted that political factors could impact the allocation of spending during recessions. Here the spending was not directly related but due to a defense buildup and fell into familiar geographical channels. This change in spending was independent of giver or taker status.

7 Conclusion

While it has long been known that states have different balance of payments with the federal government, there has been little research as to the effects of these differentials. In this paper, we first demonstrate that during the Great Recession "giver" states –those with an overall deficit to the federal government– improved their fiscal balances more than "taker" states –those with overall surpluses with the federal government. Our robust results from a straightforward difference-in-differences specification show that in the Great Recession both revenues fell more and expenditures increased more in giver states. The revenue effect, including both individual and corporate taxes, occurred earlier in the recession while the spending effects tended to emerge later, perhaps due to a lag in discretionary fiscal policy.

We also explored the role that changes in the states' fiscal balances had on gross state product in this period. The growth rate of gross state product in giver states –controlling for state and time effects as well as lagged

growth rates– was significantly higher post-recession than for taker states. Assuming a cause of this differential was because of changes in states' balance of payments with the federal government, we used an instrumental variable approach to estimate the size of this channel and find it to be large. Thus, giver states not only benefitted more in terms in improvements in their fiscal balances over the last business cycle, but they also most likely grew faster precisely because of the changes to their fiscal positions.

Our results from analyzing the 2001 recession suggest that while taxes in giver states are likely to be forces for stabilization, spending patterns may differ across recessions. These may reflect the political affiliation of administrations or responses to national crises. In principle, however, changes in fiscal balances can have important impacts on state GDP growth.

Examining the cyclical role of state fiscal balances can potentially provide new perspectives on some important tax policy issues. With the SALT limitation and the increase in the standard deduction, a much smaller proportion of taxpayers now itemize deductions, roughly around 11 percent. This means that income tax deductions themselves will become less cyclical. Since prior to these changes, itemized deductions tended to rise and fall with income, the reduced cyclicality of deductions is likely to make federal tax payments by individuals more sensitive to the business cycle. This means that fiscal balances in giver states are likely to become even more cyclically sensitive which, as we have shown, can provide an economic boost to the economy of these states. In short, changes to the federal tax system

should be explored not just on their distributional effects across taxpayers and states, but also on their cyclical effects.

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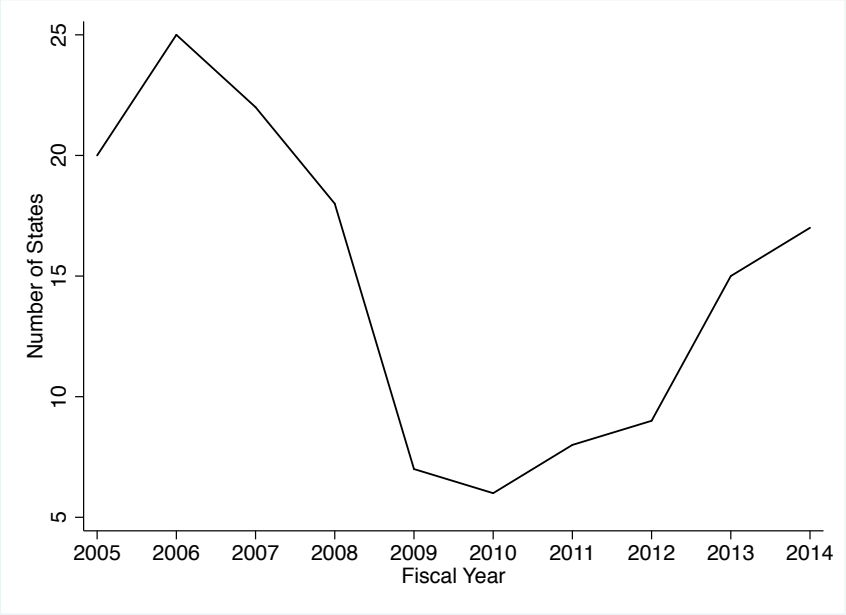
Figures and Tables

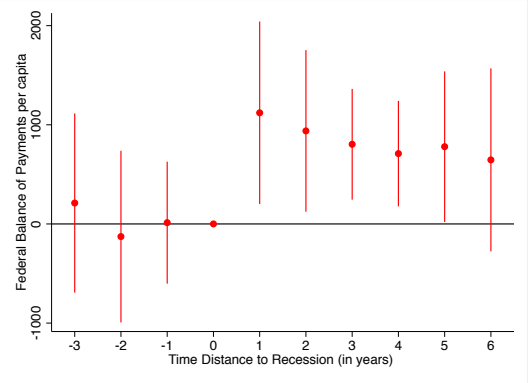
Figure 1: Giver States



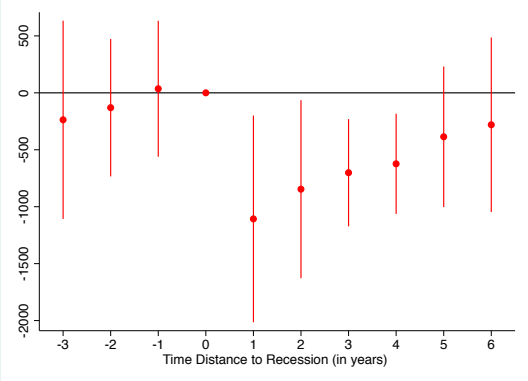
NOTES. - We classify states as being giver or taker according to their Federal balance of payments in fiscal year 2005. We take 2005 giver/taker status of a state constant throughout the sample period, although the status for many states change after the 2008 Great Recession.

Figure 2: The Effect of the Giver Status on Fiscal Measures after the Recession

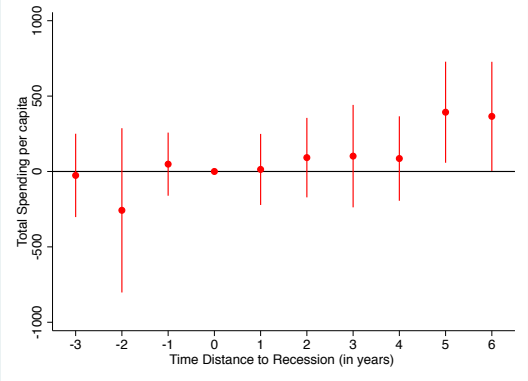
A. Federal Balance of Payments
(per capita, in $2009)



B. Total Federal Taxes paid
(per capita, in $2009)



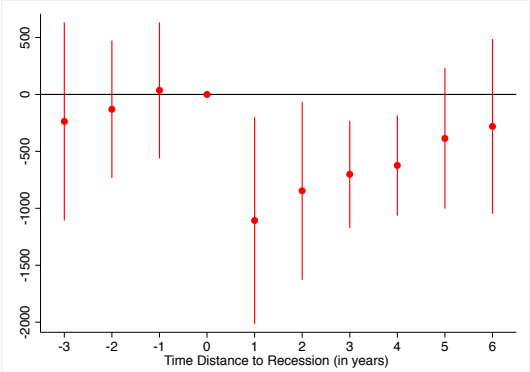
C. Total Federal Spending received
(per capita, in $2009)



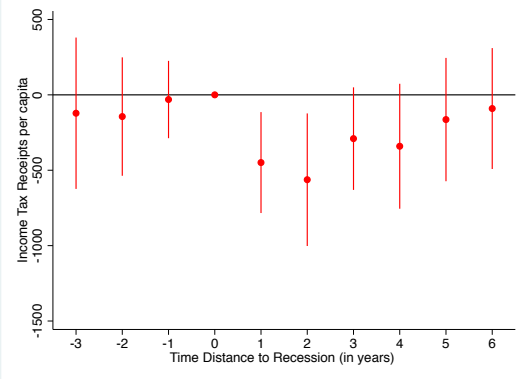
NOTES. - The points estimate are obtained from the following specification; $Y_{st} = \alpha + \sum_{t=2005}^{2014} \beta_t \big(Giver_s \times \boldsymbol{I}(Year = t)\big) + \gamma_s + \nu_{st}$. The event study estimates the effect of being a giver states on the given fiscal measure for each year separately given by β_t. The binary variable $\boldsymbol{I}(Year = t)\big)$ turns on if the observation belongs to year t. The excluded year is 2008.

Figure 3: The Effect of the Giver Status on Federal Taxes paid after the Recession

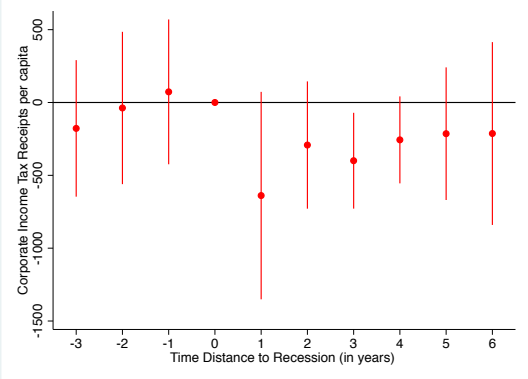
A. Total Federal Taxes paid
(per capita, in $2009)



B. Individual Income and Employment Taxes
(per capita, in $2009)



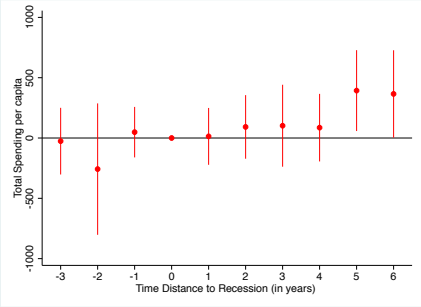
C. Business Income Taxes
(per capita, in $2009)



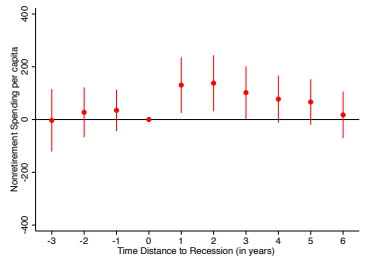
NOTES. - The points estimate are obtained from the following specification; $Y_{st} = \alpha + \sum_{t=2005}^{2014} \beta_t \big(Giver_s \times \boldsymbol{I}(Year = t)\big) + \gamma_s + \nu_{st}$. The event study estimates the effect of being a giver states on the given fiscal measure for each year separately given by β_t. The binary variable $\boldsymbol{I}(Year = t)\big)$ turns on if the observation belongs to year t. The excluded year is 2008.

Figure 4: The Effect of the Giver Status on Federal Spending after the Recession

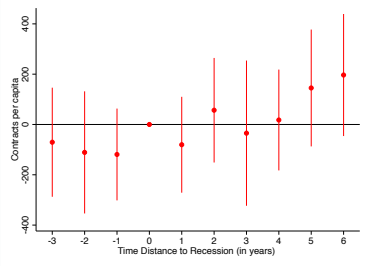
A. Total Federal Spending received
(per capita, in $2009)



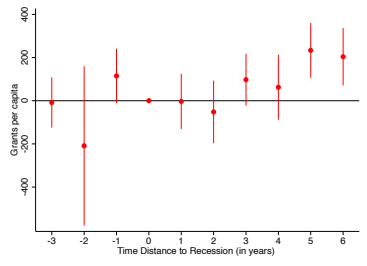
B. Non-retirement Benefits
(per capita, in $2009)



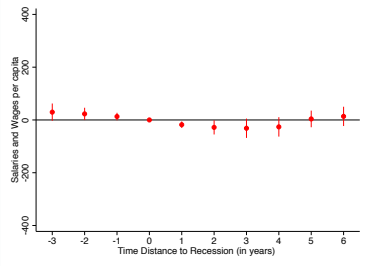
C. Contracts
(per capita, in $2009)



D. Grants
(per capita, in $2009)

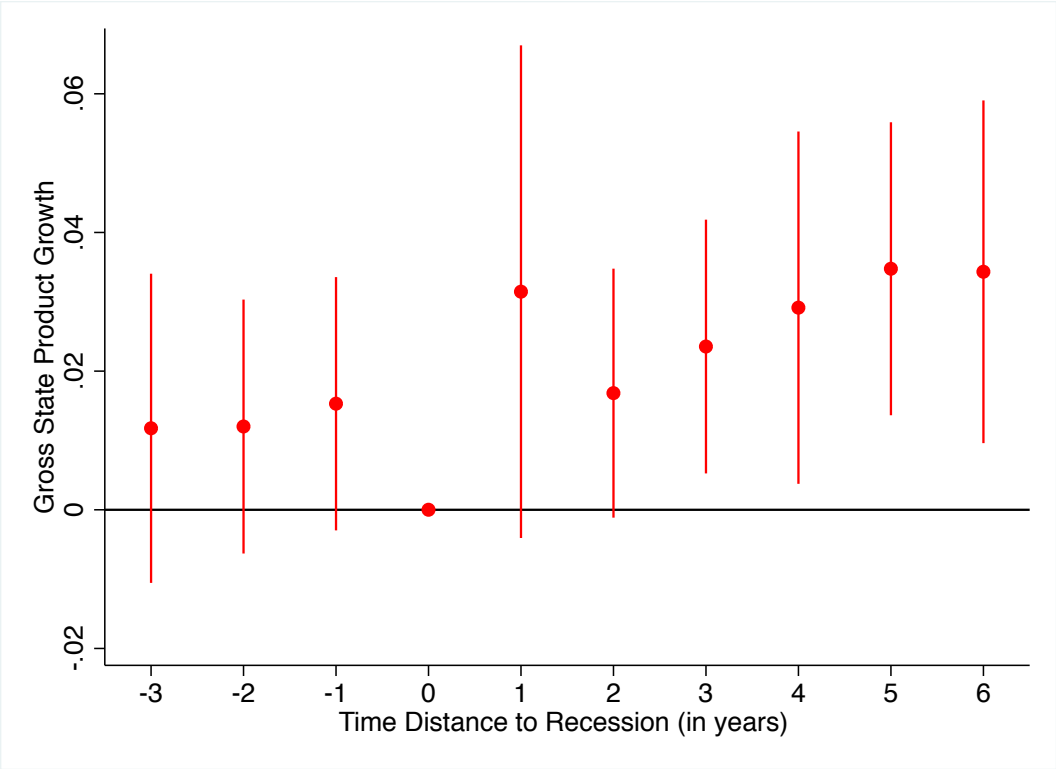


E. Salaries and Wages
(per capita, in $2009)



NOTES. - The points estimate are obtained from the following specification; $Y_{st} = \alpha + \sum_{t=2005}^{2014} \beta_t \big(Giver_s \times \boldsymbol{I}(Year = t)\big) + \gamma_s + \nu_{st}$. The event study estimates the effect of being a giver states on the given fiscal measure for each year separately given by β_t. The binary variable $\boldsymbol{I}(Year = t)\big)$ turns on if the observation belongs to year t. The excluded year is 2008.

Figure 5: The Effect of the Giver Status on Gross State Product Growth



NOTES. - The points estimate are obtained from the following specification; $G_{st} = \alpha + \sum_{t=2005}^{2014} \beta_t \big(Giver_s \times \boldsymbol{I}(Year = t)\big) + \gamma_s + \phi G_{st-1} + \nu_{st}$. The event study estimates the effect of being a giver states on yearly GSP growth for each year separately given by β_t. The binary variable $\boldsymbol{I}(Year = t)\big)$ turns on if the observation belongs to year t. The excluded year is 2008.

Table 1: Gross Revenue Collections by Type of Tax, Fiscal Year 2014

Type of Tax	Amount ($ 000)	Share in Total (%)
Total Internal Revenue Collections	3,064,301,358	100.00
Business Income Taxes	353,141,112	11.52
Individual Income Tax withheld and FICA[a] tax	2,067,747,446	67.48
Individual Income Tax Payments and SECA[b] tax	508,123,572	16.58
Unemployment Insurance Tax	8,611,877	0.28
Railroad Retirement Tax	5,953,524	0.19
Estate and Trust Income Tax	29,410,796	0.96
Estate Tax	17,572,338	0.57
Gift Tax	2,582,617	0.08
Excise Taxes	71,158,076	2.32

NOTES. - Source: Internal Revenue Service Data Book, 2014 Publication 55 B Washington, DC March 2015.
a Federal Insurance Contributions Act
b Self-Employment Insurance Contributions Act

Table 2: Federal Spending by Category, Fiscal Year 2014

Spending Category	Amount ($ 000)	Share in Total (%)
Total Federal Spending	3,252,754,101	100.00
Contracts	355,760,939	10.94
Grants	588,586,991	18.10
Nonretirement Benefits	895,415,395	27.53
Retirement Benefits	1,107,747,776	34.06
Salaries and Wages	305,243,000	9.38

NOTES. - Source: Federal Spending in the States, 2005 to 2014. The Pew Charitable Trusts. March 2016.

Table 3: Federal Balance of Payments per capita (in $2009)

2005			2009			2014		
State	Balance	Rank	State	Balance	Rank	State	Balance	Rank
Alaska	9358	1	Alaska	10184	1	New Mexico	9051	1
New Mexico	7730	2	New Mexico	10032	2	Hawaii	7931	2
Mississippi	6955	3	Virginia	9479	3	West Virginia	7594	3
West Virginia	5935	4	Hawaii	8828	4	Alaska	7364	4
Virginia	5872	5	Mississippi	8336	5	Mississippi	7181	5
Hawaii	5800	6	West Virginia	8092	6	Virginia	6816	6
Alabama	5023	7	Alabama	7748	7	Alabama	6736	7
Maine	4599	8	Maryland	7447	8	Maine	6078	8
Montana	4284	9	South Carolina	7442	9	South Carolina	5664	9
South Carolina	4115	10	Maine	6950	10	Maryland	5393	10
Louisiana	3809	11	Kentucky	6054	11	Montana	4722	11
North Dakota	3682	12	Montana	5917	12	Kentucky	4588	12
Kentucky	3678	13	Vermont	5806	13	Vermont	3985	13
Maryland	3654	14	Arizona	5388	14	Arizona	3947	14
Arizona	3051	15	Idaho	5216	15	Idaho	3564	15
South Dakota	2881	16	North Dakota	4683	16	**Michigan**	**2570**	**16**
Vermont	2134	17	South Dakota	4119	17	North Carolina	2384	17
Wyoming	1401	18	**Michigan**	**4101**	**18**	**Nevada**	**2363**	**18**
Idaho	1338	19	**Oklahoma**	**3980**	**19**	Florida	2232	19
Utah	1329	20	Florida	3949	20	Oregon	2193	20
Florida	1091	21	Louisiana	3684	21	South Dakota	1853	21
Missouri	1052	22	Missouri	3575	22	Tennessee	1642	22
Oregon	820	23	Oregon	3482	23	**Oklahoma**	**1638**	**23**
Tennessee	552	24	Washington	3235	24	Iowa	1293	24
Indiana	290	25	**Nevada**	**3224**	**25**	Georgia	1209	25
Iowa	285	26	Tennessee	3186	26	Washington	1164	26
Washington	152	27	North Carolina	2985	27	New Hampshire	1138	27
Kansas	118	28	Kansas	2819	28	Utah	975	28
North Carolina	48	29	Indiana	2790	29	Wyoming	796	29
New Hampshire	32	30	Wyoming	2769	30	Pennsylvania	651	30
			Georgia	2766	31	Louisiana	625	31
Pennsylvania	-281	31	Iowa	2649	32	Indiana	488	32
Oklahoma	**-337**	**32**	Wisconsin	2621	33	Missouri	290	33
Michigan	**-586**	**33**	New Hampshire	2618	34			
California	-856	34	Utah	2546	35	Colorado	-144	34
Georgia	-860	35	California	2004	36	Arkansas	-161	35
Nevada	**-938**	**36**	Pennsylvania	1962	37	Wisconsin	-241	36
Wisconsin	-1020	37	Colorado	1516	38	California	-318	37
Texas	-1062	38	Arkansas	1308	39	Kansas	-327	38
Colorado	-1599	39	Rhode Island	928	40	North Dakota	-603	39
Arkansas	-1611	40	Massachusetts	866	41	Texas	-1224	40
Rhode Island	-1641	41	Texas	502	42	Rhode Island	-1376	41
Massachusetts	-1902	42	Ohio	145	43	Ohio	-1690	42
Ohio	-2022	43				New York	-2263	43
Nebraska	-2945	44	New York	-26	44	Illinois	-2710	44
New York	-3314	45	Nebraska	-224	45	Massachusetts	-3426	45
Illinois	-3765	46	Illinois	-422	46	**Connecticut**	**-3515**	**46**
Connecticut	**-5482**	**47**	**Connecticut**	**-816**	**47**	Nebraska	-3639	47
New Jersey	-5767	48	New Jersey	-2579	48	New Jersey	-5308	48
Minnesota	-8090	49	Minnesota	-4499	49	Minnesota	-8019	49
Delaware	**-9768**	**50**	**Delaware**	**-5709**	**50**	**Delaware**	**-9071**	**50**

NOTES. - Bold states represent top five states in terms of the largest improvement in Federal balance of payments per capita from 2005 to 2009.

Table 4: Descriptive Statistics

	Giver States		Taker States	
	Pre-Rec	Post-Rec	Pre-Rec	Post-Rec
Gross State Product (GSP)	50,468.28	50,084.85	44,769.62	45,406.99
(per capita, in $2009)	(928.59)	(736.81)	(819.46)	(739.30)
GSP Growth	0.84	1.31	2.65	1.08
(yearly, %)	(0.34)	(0.25)	(0.37)	(0.26)
Federal Balance of Payments	-2,951.27	-412.23	2,963.25	4,693.52
(per capita, in $2009)	(368.34)	(308.75)	(247.40)	(203.97)
Total Federal Taxes paid	10,749.42	9,663.87	6,429.10	5,918.21
(per capita, in $2009)	(371.81)	(312.32)	(145.13)	(116.04)
Individual Inc. and Emp. Taxes	8,385.70	7,886.30	5,641.35	5,384.03
(per capita, in $2009)	(255.30)	(221.61)	(118.51)	(102.05)
Business Income Taxes	2,024.54	1,513.29	620.17	409.02
(per capita, in $2009)	(163.53)	(121.43)	(39.01)	(19.43)
Total Federal Spending received	7,798.16	9,251.64	9,392.35	10,611.73
(per capita, in $2009)	(104.19)	(96.89)	(204.28)	(163.20)
Retirement Spending	2,556.60	2,998.96	2,781.71	3,274.32
(per capita, in $2009)	(32.63)	(33.20)	(30.04)	(30.87)
Nonretirement Spending	2,102.26	2,787.11	2,018.33	2,629.40
(per capita, in $2009)	(43.50)	(34.09)	(40.46)	(29.61)
Grants	1,498.44	1,794.01	1,791.62	1,971.24
(per capita, in $2009)	(40.62)	(42.30)	(74.62)	(52.48)
Contracts	931.43	958.31	1,593.57	1,495.07
(per capita, in $2009)	(63.05)	(58.74)	(111.21)	(93.12)
Population	9.09	9.44	3.92	4.11
(in millions)	(0.96)	(0.82)	(0.32)	(0.28)

NOTES. - We classify states as being giver or taker according to their Federal balance of payments in fiscal year 2005. Pre-Recession years include 2005 through 2008 while Post-Recession years include 2009 through 2014.

Table 5: The Effect of the Giver Status on Fiscal Measures after the Great Recession

Dependent Variable (per capita, in $2009)	
Federal Balance of Payments	808.77***
	(280.21)
Total Taxes paid	-574.67**
	(221.92)
Individual Income and Employment Taxes	-242.08
	(178.95)
Business Income Taxes	-300.10***
	(107.83)
Total Spending received	234.10*
	(135.70)
Non-retirement Benefits	73.79*
	(43.91)
Retirement Benefits	-50.25*
	(28.92)
Grants	115.96*
	(63.78)
Contracts	125.39**
	(62.32)
Observations	500

NOTES. - The empirical specification follows;
$Y_{st} = \alpha + \beta(Giver_s \times PostRec_t) + \gamma_s + \delta_t + \epsilon_{st}$. Robust standard errors, which are clustered at the state level, are in parentheses. The table displays coefficients β for each dependent variable.
$^{*}p < 0.1,^{**} p < 0.05,^{***} p < 0.01$

Table 6: The Effect of the "Giver" Status on GSP Growth after the Great Recession

Giver × Post-Recession	1.96**
	(0.78)
Lagged GSP Growth	0.1186**
	(0.0573)
Observations	500

NOTES. - The empirical specification follows;
$G_{st} = \alpha + \beta(Giver_s \times PostRec_t) + \gamma_s + \delta_t + \phi G_{st-1} + \epsilon_{st}$. Robust standard errors, which are clustered at the state level, are in parentheses. The table displays coefficients β for each dependent variable.
$^{*}p < 0.1,^{**} p < 0.05,^{***} p < 0.01$

Table 7: The Effect of Federal Balance of Payments on GSP Growth

	OLS	IV
Federal Balance of Payments (per capita, in 2009 $)	0.1698 (0.1843)	2.2467** (1.1208)
Lagged GSP Growth (per capita, in 2009 $)	0.1349** (0.0518)	0.1681 (0.1050)
		First Stage
		808.77*** (281.49) [127.21]
Observations	500	500

NOTES. - The ordinary least squares specification takes the following form; $G_{st} = \alpha + \beta Y_{st} + \gamma_s + \delta_t + \phi G_{st-1} + \eta_{st}$, where G_{st} is the growth rate in GSP of state s in year t and Y_{st} is the Federal balance of payments.
The instrumental variables specification follows, $G_{st} = \alpha + \beta\widehat{Y_{st}} + \gamma_s + \delta_t + \phi G_{st-1} + \eta_{st}$, where $\widehat{Y_{st}}$ is the fitted value of Federal Balance of payments for state s at year t from the following first stage estimation $Y_{st} = \alpha + \beta(Giver_s \times PostRec_t) + \gamma_s + \delta_t + \epsilon_{st}$.
Robust standard errors, which are clustered at the state level, are in parentheses. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$

Table 8: The Effect of Great Recession on Gross State Product by 2005 Rankings

Dependent Variable: Gross State Product Growth (yearly percentage)			
States Ranked by	1^{st} Quartile	2^{nd} Quartile	3^{rd} Quartile
Federal Balance of Payments in 2005	2.11**	1.32	-0.07
1^{st} Quartile: "Biggest Givers States"	(0.94)	(0.99)	(1.38)
GSP per capita in 2005	-1.21	0.46	0.75
1^{st} Quartile: "The Richest States"	(1.39)	(0.64)	(0.72)
Total Federal Taxes Paid in 2005	1.56**	0.03	-0.98
1^{st} Quartile: "Top Payers"	(0.64)	(0.64)	(1.45)
Total Federal Spending Received in 2005	1.89**	0.74	1.43
1^{st} Quartile: "Lowest Receivers"	(0.91)	(1.49)	(0.86)
Observations	500	500	500

NOTES. - The empirical specification follows;
$G_{st} = \alpha + \sum_{q=1}^{4} \beta_q \big(Quarter_q \times PostRec_t\big) + \gamma_s + \delta_t + \phi G_{st-1} + \kappa_{st}$. The variable $Quarter_q$ indicates the quartile that the state is assigned to according to different methods of ranking. Each row represent the results of a separate method of ranking explained in the first column. As before, γ_s and δ_t represent state and time fixed effects and κ_{st} is the error term. The lagged growth rate G_{st-1} accounts for a possible autocorrelation in the growth rate of GSP. The coefficient β_q displays the change in the yearly percentage growth rate for states in the q^{th} quartile after the Great Recession compared to the fourth quartile. Robust standard errors, which are clustered at the state level, are in parentheses.
$^{*}p < 0.1, ^{**}p < 0.05, ^{***}p < 0.01$

Table 9: The Effect of the Giver Status on Fiscal Measures after the 2001 Recession

Dependent Variable (per capita, in $2015)	
Federal Balance of Payments	-98.90 (178.49)
Total Taxes paid	-383.92*** (129.12)
Individual Income and Employment Taxes	-273.36** (115.42)
Business Income Taxes	-86.84 (74.61)
Total Spending received	-482.82*** (152.97)
Retirement Benefits	-78.42*** (20.82)
Grants	-154.94** (76.01)
Procurement	-198.03* (109.72)
Observations	350

NOTES. - The empirical specification follows;
$Y_{st} = \alpha + \beta(Giver_s \times PostRec_t) + \gamma_s + \delta_t + \epsilon_{st}$. Robust standard errors, which are clustered at the state level, are in parentheses. The table displays coefficients β for each dependent variable. $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$

8 Appendix

Table A1: The Effect of the "Giver" Status after the 2008 Recession using State Specific Linear Time Trends

Dependent Variable (per capita, in $2009)	(1)	(2)
Federal Balance of Payments	808.77***	1190.74***
	(280.21)	(357.38)
Total Taxes paid	-574.67**	-1293.48***
	(221.92)	(357.35)
Individual Income and Employment Taxes	-242.08	-621.70***
	(178.95)	(211.88)
Business Income Taxes	-300.10***	-650.20***
	(107.83)	(192.23)
Total Spending received	234.10*	-102.74
	(135.70)	(128.22)
Non-retirement Benefits	73.79*	161.20***
	(43.91)	(59.59)
Retirement Benefits	-50.25*	0.21
	(28.92)	(9.58)
Grants	115.96*	-129.10*
	(63.78)	(67.87)
Contracts	125.39**	-86.49
	(62.32)	(113.18)
Observations	500	500
State Specific Linear Time Trends	No	Yes

NOTES. - The empirical specification follows;
$Y_{st} = \alpha + \beta(Giver_s \times PostRec_t) + \gamma_s + \delta_t + \epsilon_{st}$. Robust standard errors, which are clustered at the state level, are in parentheses. The table displays coefficients β for each dependent variable.
$^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$