2-7-2015

Lottery Tax Windfalls, State-Level Fiscal Policy, and Consumption

Zhi Da
University of Notre Dame

Mitch Warachka
Chapman University, warachka@chapman.edu

Hayong Yun
Michigan State University

Recommended Citation

Da, Z., Warachka, M., & Yun, H. (2015). Lottery tax windfalls, state-level fiscal policy, and consumption. *Economics Letters, 129*, 9-12. https://doi.org/10.1016/j.econlet.2015.01.028

Lottery Tax Windfalls, State-Level Fiscal Policy, and Consumption

Lottery Tax Windfalls, State-Level Fiscal Policy, and Consumption*

Zhi Da†, Mitch Warachka‡, and Hayong Yun§

July 2013

Abstract

State governments receive an exogenous tax windfall whenever their residents win a multi-state lottery. These lottery tax windfalls are counter-cyclical but occur during a range of economic conditions. Therefore, lottery tax windfalls enable us to estimate the impact of fiscal policy on consumption during bust as well as boom periods to account for time-varying household borrowing constraints. Furthermore, lottery tax windfalls facilitate increased government spending or tax reductions without the issuance of debt, thereby circumventing Ricardian equivalence. We find evidence that lottery tax windfalls facilitate higher government expenditures on Supplementary Security Income that increase household consumption, but only during bust periods. Overall, the ability of fiscal policy to influence consumption is limited to higher expenditures during poor economic conditions.

Keywords: Lotteries, Fiscal Policy, Consumption

*We thank Phillip Dybvig and Tracy Wang as well as seminar participants at Claremont McKenna College and the South-West University of Finance in Economics (Chengdu) for their helpful comments and suggestions.

†University of Notre Dame, 239 Mendoza College of Business, Notre Dame, IN., 46556, USA. Email: zda@nd.edu

‡Robert Day School of Economics and Finance, Claremont McKenna College, 500 East Ninth Street, Bauer Building, Claremont, CA., 91711, USA. Email: mwarachka@cmc.edu

§Eli Broad College of Business, Michigan State University, East Lansing, MI., 48824, USA. Email: chatnoir95@yahoo.com

1 Introduction

Measuring the impact of government fiscal policy on consumption is a challenge since government fiscal policies are endogenous with respect to economic conditions. Indeed, stimulus measures are usually limited to bust periods, which complicates our understanding of the relationship between fiscal policy and consumption. Parker (2011) states that:

"Unfortunately, we have very little evidence on whether the government multiplier differs with the state of the economy ... research sometimes finds evidence of larger effects of government spending in recessions, the evidence is statistically weak, highlighting the real reason for our lack of knowledge: lack of data" page 704-705

According to Ricardian equivalence (Barro-Ricardo equivalence theorem), government budget deficits cannot stimulate consumption since households increase savings in anticipation of future tax increases. Furthermore, government budget deficits are unnecessary to finance consumption provided households can borrow against their future labor income. However, household borrowing constraints (Zeldes, 1989) and difficulties hedging unemployment (Hubbard, Skinner, and Zeldes, 1994) enable increased government expenditures and / or tax reductions to increase consumption.[1]

We utilize 147 exogenous tax windfalls from multi-state lotteries to examine the influence of fiscal policy on household consumption. These tax windfalls arise from PowerBall and MegaMillion lotteries between 1998 to 2009. Lottery tax windfalls occur during boom and bust periods, while the federal tax rebates examined by Johnson, Parker, and Souleles (2006) as well as Parker, Souleles, Johnson, and McClelland (2011) are limited to bust periods in 2001 and 2008, respectively. These tax rebates were distributed via Social Security Numbers, making them random in the cross-section but not across time. In contrast, the lottery tax windfalls we study are random along both dimensions.

Without observing fiscal policy shocks in boom periods, one cannot reject the possibility that higher government expenditures or lower taxation can always increase consumption. Furthermore, our study exploits heterogeneity regarding the severity of economic fluctuations and fiscal policy across states. Therefore, our study can address the possibility that time-varying household borrowing constraints alter the relationship between fiscal policy and consumption.

Lotteries are a significant source of revenue for state governments. About 25% of the revenue from the sale of lottery tickets goes to state governments, with over $16 billion added to state coffers in 2012.[2] This lottery revenue is approximately 2% to 3% of total state revenue,

[1] In Lucas (1994), investors self-insure themselves against transitory shocks to labor income through precautionary savings. However, Storesletten, Telmer, and Yaron (2004) report that precautionary savings provide inadequate insurance against prolonged losses of income (unemployment).

[2] Does Powerball really boost the economy? Chris Isidore @CNNMoney published on November 27^{th}, 2012.

and relatively stable since it is derived from ticket sales. In contrast, approximately 60% of the total revenue from a lottery is paid out as winnings. These lottery winnings generate exogenous lottery tax windfalls for states whose residents win a multi-state lottery.[3]

Forty three states participate in multi-state lotteries while forty one states are identified as being fiscally constrained by either their balanced budget amendment or budget stabilization fund. These fiscal constraints are described in the next section. In general, fiscally constrained states participate in multi-state lotteries. Specifically, thirty seven of the forty one fiscally constrained states participate in multi-state lotteries. Our main sample consists of the forty one fiscally constrained states.

We report that lottery tax windfalls increase state government expenditures on supplementary security income, but only during bust periods. Furthermore, higher expenditures on social security income facilitated by lottery tax windfalls during bust periods increase consumption. McKay and Reis (2013) argue theoretically and demonstrate empirically that targeting inequality through transfer programs is better at stabilizing aggregate demand than programs designed to stabilize disposable income such as progressive income taxes.[4] In the absence of lottery tax windfalls, state-level expenditures on social security income and consumption both decline during bust periods. The negligible impact of lottery tax windfalls on consumption during boom periods is consistent with the alleviation of time-varying household borrowing constraints.

Several robustness tests confirm the ability of lottery tax windfalls to facilitate increased spending on social security impact and consequently increase consumption. The revenue of earnings of firms whose operations are geographically concentrated in the state receiving the lottery tax windfall both increase during bust periods. Conversely, in the absence of a lottery tax windfall, earnings decrease during bust periods. In addition, consistent with the importance of household borrowing constraints being alleviated by social security income payments, state government spending on highways does not impact consumption. Furthermore, the effect of state-year lottery tax windfalls is crucial since randomly shuffling the timing of these windfalls does not result in significantly higher expenditures on social security income or higher consumption during bust periods. Additional robustness tests are outlined later in the paper.

The remainder of this paper begins with an introduction to our data in Section 2. Our empirical results are then presented in Section 3 along with the results from several robustness tests. Our conclusion follows in Section 4.

[3] Advertising expenses and sales commissions to retail stores comprise the remaining 15% of lottery revenue.

[4] McKay and Reis (2013) also identify food stamps as an important program to stabilize aggregate demand. However, Food Stamps are issued by the federal government (US Department of Agriculture) not state governments.

2 Data

The primary source of lottery data is from the website www.portalseven.com that contains the location of Power Ball and Mega Million lottery winners.[5] Factiva is also used to supplement incomplete information. The lottery data contains three important fields; date, winning amount, and state in which the winner reside.

A brief example of the data from this website is reported below:

30-Mar-12	\$656 Million	The Three Amigos Merle and Patricia Butler Anonymous	Maryland Illinois Kansas
24-Jan-12	\$72 Million	Marcia Adams	Georgia
27-Dec-11	\$208 Million	Daniel Bruckner	New York
1-Nov-11	\$78 Million	Charles Hairston	California
30-Sep-11	\$114 Million	Group of 6 people The Jones Family	California North Carolina

Multi-state lotteries generate revenue for state governments from ticket sales as well as tax windfalls that arise from in-state lottery winners. Our study focuses exclusively on the latter since these windfalls represent large positive shocks to at least one state's revenue. Of the forty three states that participate in multi-state lotteries, thirty four impose specific taxes on lottery winnings. However, the distinction between states with and without specific lottery taxes is not salient since individual income taxes are higher as a result of an in-state lottery winner.

Our proxy for state-level consumption is retail sales defined by the total annual sales of the retail industry (NAICS 44-45) in each state. This consumption proxy has previously been used by Ostergaard, Sorensen, and Yosha (2002) and Korniotis (2008). Gross State Product (GSP) is an annual measure of each state's economic output. State revenue and expenditure are defined as the total annual amount of revenue and spending, respectively, of each state. Supplementary Security Income (SSI) represents annual contributions by state governments to low income households consisting of individuals aged sixty five and older as well as disabled individuals. These SSI contributions by state governments are in excess of contributions from the federal government.[6] GSP and SSI for each state are obtained from the US Census Bureau's Compendia database.

The impact of lottery tax windfalls on state-level fiscal policy is predicted to be greater in states that are fiscally constrained. Intuitively, states that cannot issue debt to finance tax

[5]Early in our sample, these lotteries were previously known as The Big Game.

[6]Federal SSI funding is from the US Treasury not the Social Security Trust Fund.

reductions or increased spending during bust periods are more reliant on lottery tax windfalls. The Advisory Commission on Intergovernmental Relations (1987) summarizes the stringency of each state's balanced budget amendment by assigning states an ACIR score between zero and ten. A higher ACIR score corresponds to a more stringent balanced budget amendment. Variation in the ACIR index accounts for whether a state's balanced budget amendment is constitutional or statutory, enforced by an independent or politically appointed judge, and accompanied by governor veto power. Bohn and Inman (1996) emphasize the stringency provided by end-of-the-year (not beginning-of-the-year) constitutional budget restrictions (not statutory) enforced by independent (not politically appointed) state supreme courts.[7] Poterba (1994) uses the ACIR variable to explain the response of fiscal policy to unexpected deficits.

States have also adopted budget stabilization ("rainy day") funds to institutionalize savings. Wagner and Elder (2005) describe the deposit and withdrawal rules associated with stabilization funds, which range from one to five. As with the ACIR index, higher values denote more stringent requirements. These authors also report that state government expenditures are less volatile in states with stringent budget stabilization fund requirements because of the rules governing their deposits and withdrawals.

The balanced budget amendment and stabilization fund thresholds that identify a fiscally constrained state are two and three, respectively. These thresholds define the smallest possible nonempty subset of states. Specifically, the ACIR index starts from zero but no state is assigned a one. Therefore, two is the smallest meaningful threshold for the ACIR index. The smallest value for the deposit and withdrawal rules is one, hence their smallest possible sum is two and the smallest meaningful threshold for this sum is consequently three. In summary, states that are not fiscally constrained have the least stringent balanced budget amendments and the least stringent rules governing their budget stabilization fund.

Panel A of Table 2 provides summary statistics for annual state-level retail sales (consumption), GSP, and SSI expenditures during the 1998 to 2009 sample across all 50 states. Summary statistics for levels, which vary significantly across states, and log-growth rates that vary less across states are both presented. In Panel B, summary statistics are reported for the subset of 41 fiscally constrained states.

As indicated by Panel C of Table 2, lottery participation is counter-cyclical. Consequently, lottery tax windfalls relative to SSI are larger and more frequent during bust periods than during boom periods. The larger lottery tax windfalls (relative to SSI) in bust periods mo-

[7]The National Conference of State Legislatures (2004) estimates that at least 75% of government expenditures are affected by balanced budget amendments. These amendments apply to a state's general fund, which defines the majority of its discretionary budget. Bohn and Inman (1996) conclude that balanced budget amendments are not responsible for transferring general fund deficits into other funds designed for employee pensions or capital expenditures.

tivates our use of state-year dummy variables that equal one if there is at least one lottery winner in a state in a particular year. These dummy variables are not related to the amount of the lottery tax windfall. Consequently, these variables are immune to any difference in the tax implications of lottery winners opting to receive a lump sum payment or annuity.

3 Empirical Results

Our empirical tests investigate the impact of lottery tax windfalls on growth in state government expenditures for social security income and state government revenue as well as growth in personal incomes. Our focus on SSI expenditures is motivated by these payments being directed towards households with the most stringent budget constraints. Similarly, we focus on individual income tax collections since corporate taxes and other fees received by state governments are not expected to be sensitive to lottery windfalls. After examining the impact of lottery tax windfalls on SSI expenditures, we examine the consumption implications of these expenditures as well as the direct link between lottery tax windfalls and consumption.

3.1 Lottery Tax Windfalls, SSI Expenditures, and Consumption

The respective impacts of lottery tax windfalls on SSI expenditures and the impact of both lottery tax windfalls and SSI expenditures on state-level consumption are reported in Table 3. State-year panel regressions with state and year fixed effects are utilized by this analysis. Standard errors in these panel regressions are clustered at the state level during the 1998 to 2009 sample period.

The first panel regression investigates the consumption (CON) implications of SSI spending

$$\begin{aligned} \mathrm{CON}_{j,t} &= \beta_1 \,\mathrm{Bust}_{j,t} + \beta_2 \,\mathrm{Boom}_{j,t} + \beta_3 \,\mathrm{SSI}_{j,t} + \beta_4 \,\mathrm{Bust} * \mathrm{SSI}_{j,t} + \beta_5 \,\mathrm{Boom} * \mathrm{SSI}_{j,t} \\ &\quad + \gamma_1 \,\mathrm{State}_j + \gamma_2 \,\mathrm{Year}_t + \epsilon_{j,t} \,. \end{aligned} \tag{1}$$

where $\mathrm{DLW}_{j,t}$ equals one if there is a lottery winner in state j in year t and zero otherwise. State_j and Year_t refer to state and year fixed effects. A subsequent panel regression

$$\begin{aligned} \mathrm{X}_{j,t} &= \beta_1 \,\mathrm{Bust}_{j,t} + \beta_2 \,\mathrm{Boom}_{j,t} + \beta_3 \,\mathrm{DLW}_{j,t} + \beta_4 \,\mathrm{Bust} * \mathrm{DLW}_{j,t} + \beta_5 \,\mathrm{Boom} * \mathrm{DLW}_{j,t} \\ &\quad + \gamma_1 \,\mathrm{State}_j + \gamma_2 \,\mathrm{Year}_t + \epsilon_{j,t} \end{aligned} \tag{2}$$

has a dependent variable X that equals state-level consumption, SSI expenditures, personal income, and individual income tax collections in each year.

According to Table 3, higher state-level SSI expenditures coincide with higher state-level consumption, although this effect is limited to bust periods since the β_4 coefficient is positive while the β_3 and β_5 coefficients are insignificant. In particular, the interaction between Bust

and SSI is 0.2959 (t-statistic of 2.09) when consumption is the independent variable. This contrasts with a decline in consumption during bust periods that are not accompanied by lottery tax windfalls since the β_1 coefficient is -0.0150 (t-statistic of -2.57).

Table 3 also indicates that state governments use lottery tax windfalls to increase SSI expenditures, but only in bust periods, as the interaction between the Bust and Lottery dummy variables has a positive β_4 coefficient of 0.0069 (t-statistic of 2.13) when SSI is the independent variable. This contrasts with SSI payments being lower unconditionally during bust periods as the β_1 coefficient is -0.0052 (t-statistic of -1.96). Thus, while state government SSI expenditures decline during bust periods in our sample of 41 fiscally constrained states, they increase in years that coincide with lottery tax windfalls.

An alternative specification replaces the lottery win dummy variables DLW with the dollar-denominated amount of the lottery tax windfall. The previous interaction between the Bust and Lottery dummy variables has a positive β_4 coefficient of 0.0113 (t-statistic of 1.94). However, when the dollar-denominated amount of the lottery tax windfall replaces DLW, this coefficient increases to 12.0461 and becomes more significant (t-statistic of 3.84).

Overall, lottery tax windfalls during bust periods facilitate higher government expenditures on SSI that increase consumption. However, during boom periods, neither of these lottery implications are apparent. Consequently, the impact of lottery tax windfalls on government spending and consumption are limited to bust periods. This evidence is consistent with household borrowing constraints, especially for SSI recipients, being tighter when economic growth rates are lower.

The last two columns of Table 3 are consistent with lottery tax windfalls increasing personal income, but only during bust periods. Indeed, the effect of lottery tax windfalls on personal income during boom periods is inconsequential. In addition, lottery wins increase individual income tax collections unconditionally but not during boom or bust periods. The insignificant impact of lottery wins on individual income tax collections in bust periods may be attributed to an overall reduction in personal income. Conversely, the decline in individual income tax collections during boom periods may result from government tax cuts.

3.2 Firm Implications of Lottery Tax Windfalls

To confirm the impact of lottery windfalls on consumption in bust periods, we estimate firm-quarter panel regressions using single-state retail firms. Single-state firms are identified using the dataset of Garcia and Norli (2010) while retail firms are identified by SIC codes 5000 through 5999. Firm and year fixed effects are included during the 1998 to 2009 sample period. Standard errors are clustered at the state level as the source of variation is state-level lottery wins.

The results in Panel A of Table 4 are based on the following panel regression

$$\begin{aligned} \text{Retail}_{i,t} &= \beta_1 \,\text{Bust}_{j,t} + \beta_2 \,\text{Boom}_{j,t} + \beta_3 \,\text{DLW}_{j,t} + \beta_4 \,\text{Bust * DLW}_{j,t} + \beta_5 \,\text{Boom * DLW}_{j,t} \\ &\quad + \beta_6 \,\text{Log(Assets)}_{i,t} + \beta_7 \,\text{DA}_{i,t} + \beta_8 \,\text{MB}_{i,t} + \gamma_1 \,\text{Firm}_i + \gamma_2 \,\text{Year}_t + \epsilon_{i,t} \end{aligned} \tag{3}$$

where $\text{Retail}_{i,t}$ denotes the annual revenue or annual earnings of 58 single-state retail firms. These 58 firms are headquartered in 20 fiscally constrained states, with details recorded in Panel B. As control variables, we include firm-level debt-to-assets (DA) and market-to-book (MB) ratios from COMPUSTAT. The former is defined by short-term and long-term debt divided by non cash assets.

The results in Panel A of Table 4 indicate that during bust periods, lottery tax windfalls increase the revenue and earnings of retail firms operating in states with lottery winners. Both revenue and earnings are normalized by total assets. In particular, the β_4 coefficients for the interaction of the Bust and Lottery dummy variables are 0.1583 (t-statistic of 2.68) and 0.0789 (t-statistic of 2.51), respectively. Conversely, the β_4 coefficients for the interaction in boom periods is insignificant for earnings and positive for revenue.

3.3 Robustness Tests

Tables 5 reports on several robustness tests. The first robustness test divides our sample of 41 fiscally constrained states into two different subsets. The first subset contains 37 states that are fiscally constrained and participate in multi-state lotteries. The results in this subset are nearly identical to our main results in Table 3. The second subset consists of the 9 states that are not fiscally constrained. Consistent with these state governments having the flexibility to run large budget deficits in bust periods, lottery tax windfalls do not exert a significant impact on SSI expenditures or consumption.

Table 6 confirms that lottery tax windfalls increase government expenditures rather than tax or debt reductions. Unlike SSI payments, total government expenditures do not increase during bust periods as a result of lottery tax windfalls. This finding is not unexpected as many government expenditures decline during bust periods due to a combination of balanced budget amendments and lower government revenue.

We conduct several additional tests to ascertain the robustness of our results in Table 3. The first robustness test addresses the appropriateness of using boom and bust thresholds defined during our 1998 to 2009 sample period. To address this issue, we consider thresholds defined by GSP growth rates during an extended sample period starting in 1963. These thresholds are utilized in Da, Warachka, and Yun (2013)'s study of state-level fiscal policy. These alternative boom and bust thresholds yield similar results as those in Table 3.

The dummy variables for state-year lottery wins are replaced with a fractional count variable. This fractional count variable normalizes the total number of lottery wins in each state per year by the total number of lottery wins across all states in the same year. When aggregated across states, this state-year fractional count variable sums to one each year and is consequently not influenced by the counter-cyclical nature of lotteries. The interaction between lottery tax windfalls defined by this fractional count variable and bust periods continues to exert a positive influence on consumption.

Two placebo tests confirm the relevance of lottery wins and SSI expenditures to consumption. The first placebo test replaces SSI with government expenditures on highways. Regressing consumption on the interaction between bust periods and highway expenditures instead of the interaction between bust periods and SSI expenditures results in an insignificant coefficient (t-statistic of -0.63). Therefore, the impact of SSI expenditures on consumption is distinct from other government expenditures, a likely consequence of SSI recipients having stringent budget constraints.

The second placebo test scrambles the lottery win dummy variables by randomly assigning them to different years. A total of 1,000 random shuffles are implemented. Only 42 or 4.2% of these random shuffles produce a significantly positive coefficient for the interaction between the bust and lottery dummy variables at the 5% level. This percentage is consistent with the test's Type I error.

Finally, the time lag between lottery wins and SSI payments is difficult to examine directly with annual government expenditure data. Although state governments can spend anticipated lottery tax windfalls immediately since they have access to short-term credit, SSI recipients cannot consume additional SSI payments until they are received. The month in which each lottery win occurred is known but few wins occur towards the end of the year. Nonetheless, replacing SSI in year t with SSI in year $t+1$ leads to a marginally significant coefficient for the interaction between the BUST and DLW variables. Specifically, this coefficient is 0.0043 and has a t-statistic of 1.64. Therefore, there is evidence that lottery wins in year t increases SSI payments in year $t+1$.

4 Conclusions

Multi-state lotteries provide tax windfalls to states whose residents win the lottery. Although counter-cyclical, these windfalls occur during a range of economic conditions. These windfalls can facilitate increased government expenditures or tax reductions. We examine the impact of these fiscal policy decisions on consumption. In particular, we examine government expenditures on social security income since households receiving this assistance are expected to have the tightest budget constraints.

We find evidence that lottery tax windfalls increase government expenditures on supplementary security income, but only during bust periods. Furthermore, these higher expenditures on social security income increase consumption. Once again, this finding is limited to bust periods. In the absence of lottery tax windfalls, state-level expenditures on social security income and consumption both decline during bust periods. Consequently, lottery tax windfalls are crucially important to the fiscal policies of state governments and their impact on consumption. The negligible impact of lottery tax windfalls on consumption during boom periods is consistent with time-varying household borrowing constraints that bind during bust periods.

References

Barro, Robert J., 1974, Are government bonds net wealth? Journal of Political Economy 82, 10951117.

Da, Z., M. Warachka, and H. Yun, 2013, The impact of fiscal policy on stock returns. Working Paper.

Garcia, D., and O. Norli, 2010, Geographic dispersion and stock returns. Forthcoming in the Journal of Financial Economics.

Hubbard, G., J. Skinner, and S. Zeldes, 1994, Expanding the life-cycle model: Precautionary saving and public policy. American Economic Review 84, 174-179.

Johnson, D., J. Parker, and N. Souleles, 2006, Household expenditure and the income tax rebate of 2001. American Economic Review 96, 1589-1610.

Korniotis, G., 2008, Habit formation, incomplete markets, and the significance of regional risk for expected returns. Review of Financial Studies 21, 39-2172.

Lucas, D., 1994, Asset pricing with undiversifiable income risk and short sale constraints: Deepening the equity premium puzzle. Journal of Monetary Economics 34, 325-341.

McKay, A., and R. Reis, 2013, The role of automatic stabilizers in the US business cycle. Working Paper.

Ostergaard, C., B. Sorensen, and O. Yosha, 2002, Consumption and aggregate constraints: evidence from U.S. States and Canadian Provinces. Journal of the Political Economy 110, 634-645.

Parker, J., 2011, On measuring the effects of fiscal policy in recessions. Journal of Economic Literature 49, 703-718.

Parker, J., N. Souleles, D. Johnson, and R. McClelland, 2011, Consumer spending and the economic stimulus payments of 2008. Forthcoming in American Economic Review.

Storesletten, K., C. Telmer, and A. Yaron, 2004, Cyclical dynamics in idiosyncratic labor market risk. Journal of the Political Economy 112, 695-717.

Zeldes, S., 1989, Consumption and liquidity constraints: An empirical investigation. Journal of the Political Economy 97, 305-346.

Table 1: State Characteristics

This table reports state-level lottery participation and lottery taxes as well as the average rates of consumption growth (CON) and average economic growth rates (GSP). The proxy for state-level consumption is retail sales while GSP denotes gross state product. Social security income (SSI) denotes state government expenditures on low income households that contain elderly or disabled individuals. State-level fiscal constraints such as balanced budget amendments along with the deposit and withdrawal rules of budget stabilization funds are also reported. ACIR is a variable between zero and ten that increases with the stringency of a state's balanced budget amendment. The deposit and withdrawal rules are ranked between one and five.

State	Lottery	Lottery tax	Lottery tax	CON growth	GSP growth	SSI over Gov. Expend.	ACIR index	Deposit rules	With. rules	Fiscal Constraints
AK	No	No	0.00%	0.658%	4.891%	0.611%	6	1	1	No
AL	No	No	0.00%	1.235%	4.007%	3.856%	10	4	1	Yes
AR	Yes	Yes	7.00%	1.219%	4.171%	3.199%	9	5	5	Yes
AZ	Yes	Yes	5.00%	0.437%	5.431%	2.038%	10	4	4	Yes
CA	Yes	No	0.00%	1.125%	4.710%	3.823%	6	2	2	Yes
CO	Yes	Yes	4.00%	0.106%	5.078%	1.435%	10	3	2	Yes
CT	Yes	Yes	6.70%	0.998%	3.690%	1.270%	5	2	3	Yes
DE	Yes	No	0.00%	0.309%	4.760%	1.155%	10	2	3	Yes
FL	Yes	No	0.00%	0.415%	5.075%	3.235%	10	2	2	Yes
GA	Yes	Yes	6.00%	-0.241%	4.178%	2.793%	10	2	1	Yes
HI	No	No	0.00%	0.473%	4.370%	1.445%	10	1	3	Yes
IA	Yes	Yes	5.00%	1.748%	4.057%	1.380%	10	1	1	No
ID	Yes	Yes	7.80%	1.105%	5.351%	1.706%	10	1	1	No
IL	Yes	Yes	5.00%	0.848%	3.515%	2.498%	4	2	1	Yes
IN	Yes	Yes	3.40%	0.486%	3.320%	1.919%	10	4	4	Yes
KS	Yes	Yes	5.00%	0.804%	4.197%	1.576%	10	3	1	Yes
KY	Yes	Yes	6.00%	0.629%	3.206%	4.217%	10	2	1	Yes
LA	Yes	Yes	5.00%	2.444%	4.643%	3.609%	4	2	1	Yes
MA	Yes	Yes	5.00%	0.847%	3.978%	2.471%	3	2	1	Yes
MD	Yes	Yes	8.50%	0.469%	5.150%	1.814%	6	3	1	Yes
ME	Yes	Yes	5.00%	1.677%	4.181%	2.060%	9	2	1	Yes
MI	Yes	Yes	4.35%	0.605%	1.538%	2.265%	6	4	4	Yes
MN	Yes	Yes	7.25%	0.819%	4.285%	1.212%	8	1	1	No
MO	Yes	Yes	4.00%	0.793%	3.420%	2.524%	10	1	1	No
MS	No	No	0.00%	1.294%	3.866%	3.910%	9	1	1	No
MT	Yes	Yes	6.90%	1.687%	4.971%	1.447%	10	5	5	Yes
NC	Yes	Yes	7.00%	0.328%	4.895%	2.372%	10	2	1	Yes
ND	Yes	Yes	5.54%	2.293%	5.777%	0.993%	8	2	4	Yes
NE	Yes	Yes	5.00%	1.029%	4.369%	1.445%	10	2	2	Yes
NH	Yes	No	0.00%	1.693%	4.038%	1.190%	2	2	2	Yes
NJ	Yes	Yes	10.80%	1.717%	3.721%	1.616%	10	2	2	Yes
NM	Yes	Yes	6.00%	0.720%	3.768%	2.036%	10	2	1	Yes
NV	No	No	0.00%	0.545%	6.269%	1.779%	4	4	2	Yes
NY	Yes	Yes	8.97%	2.147%	4.028%	2.756%	3	4	2	Yes
OH	Yes	Yes	6.00%	0.612%	2.520%	2.237%	10	2	1	Yes
OK	Yes	Yes	4.00%	1.690%	4.842%	2.414%	10	2	3	Yes
OR	Yes	Yes	8.00%	-0.433%	4.763%	1.542%	8	1	1	No
PA	Yes	No	0.00%	0.998%	3.713%	2.759%	6	2	3	Yes
RI	Yes	Yes	7.00%	1.039%	4.387%	2.522%	10	1	2	Yes
SC	Yes	Yes	7.00%	0.486%	3.978%	2.231%	10	3	2	Yes
SD	Yes	No	0.00%	1.119%	5.285%	1.776%	10	2	2	Yes
TN	Yes	No	0.00%	0.444%	3.916%	3.451%	10	3	2	Yes
TX	Yes	No	0.00%	0.791%	5.242%	2.683%	8	2	2	Yes
UT	No	No	0.00%	0.466%	5.718%	0.977%	10	2	2	Yes
VA	Yes	Yes	4.00%	0.930%	5.434%	1.975%	8	4	4	Yes
VT	Yes	Yes	6.00%	2.528%	3.891%	1.505%	0	2	2	No
WA	Yes	No	0.00%	1.382%	4.872%	1.842%	8	2	3	Yes
WI	Yes	Yes	7.75%	0.936%	3.696%	1.535%	6	3	2	Yes
WV	Yes	Yes	6.50%	2.050%	3.800%	3.930%	10	2	2	Yes
WY	No	No	0.00%	3.268%	7.108%	0.734%	8	1	1	No
Average			4.13%	1.035%	4.401%	2.155%	8	2.32	2.04	

Table 2: Summary Statistics

Panel A reports the number of state-year observations for consumption, gross state product (GSP), and government expenditures on social security income (SSI). The mean, standard deviation, and median of these observations are reported for all 50 states. Both levels, which vary across states, and annualized growth rates that vary less across states are reported. Panel B replicates Panel A using the subset of 41 fiscally constrained states. A state is fiscally constrained if its ACIR index exceeds two or the sum of the deposit and withdrawal rules pertaining to its budget stabilization fund exceeds three. In Panel C, lottery tax windfalls in each state are normalized by government expenditures on social security income (SSI) in the same year. Summary statistics for these normalized windfalls are then separated into bust and boom periods. These periods are defined by years in which a state's GSP growth is in the bottom quintile and top quintile, respectively.

Panel: Summary statistics for all 50 states

		Levels			Growth rates		
	N	Mean	Std Dev	Median	Mean	Std Dev	Median
Consumption	550	15080	17857	9882	1.035%	4.906%	2.555%
GSP	600	230700	279832	142758	4.401%	3.305%	4.596%
SSI	500	746	1232	419	4.180%	2.462%	3.915%

Panel B: Summary statistics for 41 states with fiscal constraints

		Levels			Growth rates		
	N	Mean	Std Dev	Median	Mean	Std Dev	Median
Consumption	451	17011	19067	11621	0.975%	4.956%	2.641%
GSP	492	260144	299167	169309	4.352%	3.051%	4.607%
SSI	410	855	1333	481	4.087%	2.433%	3.688%

Panel C: Lottery tax windfalls / SSI

	N	Mean	Std Dev	Median
Bust	141	27.94%	54.78%	12.28%
Boom	78	9.99%	9.40%	7.73%

Table 3: Lottery Windfalls, SSI Expenditures, and Consumption

The results in this table pertain to 41 fiscally unconstrained states from 1998 to 2009. The impact of lottery tax windfalls, identified by dummy variables if a resident in a state wins the lottery during a specific year, on state government social security income (SSI) expenditures and consumption are reported. These results arise from state-year panel regressions with state and year fixed effects. Standard errors are clustered at the state level. Boom and bust periods are defined at the state-level as years in which GSP growth is in the top quintile and bottom quintile, respectively. The effects of lottery tax windfalls on personal income and individual income tax collections are also presented. All the effects are examined contemporaneously using state-year observations.

	Consumption	Consumption	Consumption	SSI	Personal Income	Individual Income Tax
Bust	-0.0150**	-0.0102**	-0.0090**	-0.0052*	-0.0169***	0.0097
	-2.57	*-2.49*	*-2.45*	*-1.96*	*-5.49*	*0.73*
SSI	-0.0966					
	-0.89					
Bust * SSI	0.2959**					
	2.09					
Boom	0.0074	0.0169***	0.0153***	-0.0035	0.0121***	0.0200**
	0.67	*5.50*	*5.26*	*-1.51*	*4.34*	*2.15*
Boom * SSI	0.1423					
	0.52					
Lottery indicator		0.0019		0.0017	0.0004	0.0160**
		0.43		*0.86*	*0.16*	*2.09*
Bust * Lottery indicators		0.0113*		0.0069**	0.0090**	0.0074
		1.94		*2.13*	*2.38*	*0.40*
Boom * Lottery indicators		-0.0081		-0.0058	0.0005	-0.0294*
		-0.83		*-0.68*	*0.09*	*-1.99*
Lottery tax windfall / total tax revenue			-4.3397**			
			-2.15			
Bust * Lottery tax windfall / total tax revenue			12.0461***			
			3.84			
Boom * Lottery tax windfall / total tax revenue			-7.2377			
			-0.61			
Constant	0.0487***	-0.0909***	-0.0905***	0.0276***	0.0524***	-0.1441***
	11.29	*-15.48*	*-15.59*	*10.21*	*31.28*	*-6.78*
Observations	369	492	492	369	492	396
R-squared	0.811	0.833	0.832	0.730	0.719	0.608

Table 4: Impact of Lottery Tax Windfalls on Single-State Retail Firms

A total of 58 retail single-state firms in 20 fiscally constrained states are examined from 1998 to 2009. The panel regressions in Panel A use revenue and earnings normalized by assets as the dependent variable. These panel regressions are implemented with firm and year fixed effects. However, standard errors are clustered at the state-level since the impact of state-level lottery tax windfalls are investigated. The log of assets, debt-to-assets ratio, and market-to-book ratio control for size, leverage, and intangible assets. Boom and bust periods are defined at the state-level as years in which GSP growth is in the top quintile and bottom quintile, respectively. Panel B contains the distribution of 58 firm-level observations across the 20 states.

Panel A: Single-state retail firms

	Revenue / Assets	Earnings / Assets
Bust	-0.0028	-0.0958**
	-0.09	*-2.38*
Boom	-0.0282	0.0297
	-1.07	*1.30*
Lottery indicator	-0.0999*	-0.0211
	-1.74	*-1.10*
Bust * Lottery indicator	0.1583**	0.0789**
	2.68	*2.51*
Boom * Lottery indicator	0.1488*	0.0025
	2.00	*0.11*
Log (Assets)	-0.1610***	0.1245***
	-3.79	*3.78*
Debt / Assets	-0.1896	-0.2835*
	-1.53	*-1.78*
Market-to-Book	0.0475***	0.0054
	3.16	*0.46*
Constant	1.3543***	-0.4755***
	8.90	*-3.61*
Observations	802	347
R-squared	0.894	0.393

Panel B: Locations of single-state retail firms

State	Number
AL	2
CA	10
CO	1
FL	6
GA	3
IL	1
IN	1
MD	1
MI	1
NC	1
NJ	1
NV	1
NY	12
OH	4
OK	1
PA	5
TX	4
VA	1
WA	1
WI	1
Total	58

Table 5: Robustness Tests

This table replicates the procedures underlying Table III within two different subsets of states. The first subset consists of the 37 states that are fiscally constrained and participate in lotteries. The second subset consists of the 9 states that are not fiscally constrained. The impact of lottery tax windfalls, identified by dummy variables if a resident in a state wins the lottery during a specific year, on state government social security income (SSI) expenditures and consumption are reported. These results arise from state-year panel regressions with state and year fixed effects. Standard errors are clustered at the state level. Boom and bust periods are defined at the state-level as years in which GSP growth is in the top quintile and bottom quintile, respectively. All the effects are examined contemporaneously in the same year.

	Fiscally constrained states with lotteries (37 states)				Fiscally unconstrained states (9 states)			
	Consumption	SSI	Personal Income	Individual Income Tax	Consumption	SSI	Personal Income	Individual Income Tax
Bust	-0.0162**	-0.0062**	-0.0175***	0.0098	-0.0105	-0.0002	-0.0100	0.0068
	-2.69	*-2.30*	*-5.34*	*0.64*	*-0.60*	*-0.01*	*-1.69*	*0.30*
SSI	-0.0779				-0.0007			
	-0.67				*0.00*			
Bust * SSI	0.3176**				0.0205			
	2.18				*0.06*			
Boom	0.0032	-0.0033	0.0102***	0.0166	0.0041	-0.0043	0.0140**	0.0158
	0.27	*-1.37*	*3.72*	*1.63*	*0.20*	*-0.75*	*2.67*	*1.41*
Boom * SSI	0.2058				0.0972			
	0.74				*0.22*			
Lottery indicator		0.0012	0.0002	0.0153*		-0.0021	-0.0002	-0.0250
		0.61	*0.08*	*1.98*		*-0.50*	*-0.04*	*-1.05*
Bust * Lottery indicators		0.0082**	0.0088**	0.0060		-0.0055	-0.0024	0.0164
		2.51	*2.27*	*0.31*		*-0.75*	*-0.29*	*0.43*
Boom * Lottery indicators		-0.0066	0.0020	-0.0255		0.0087	0.0002	-0.0250
		-0.79	*0.35*	*-1.62*		*1.11*	*0.02*	*-0.88*
Constant	0.0390***	0.0425***	0.0537***	-0.1421***	-0.0587**	0.0943***	0.0513***	0.0554**
	6.49	*19.96*	*31.43*	*-5.96*	*-3.03*	*6.42*	*14.16*	*3.04*
Observations	333	333	444	363	81	81	108	77
R-squared	0.807	0.736	0.728	0.594	0.801	0.744	0.718	0.692

Table 6: Lottery Tax Windfalls and Fiscal Policy

Within the subset of 41 fiscally unconstrained states, this table records the impact of lottery tax windfalls on state-level government revenue, expenditures, and debt. Boom and bust periods are defined at the state-level as years in which GSP growth is in the top quintile and bottom quintile, respectively. For the state-year panel regressions, the lottery indicator variables are one if at least one state resident wins the lottery in a particular year. Both state and year fixed effects are included, with standard errors clustered at the state level.

	Government Revenue	Government Expenditures	Government Debt
Bust	-0.0174	-0.0070	0.0164
	-0.70	*-1.22*	*0.89*
Boom	-0.0106	0.0091	0.0049
	-0.74	*1.52*	*0.28*
Lottery indicator	-0.0131	0.0146**	-0.0059
	-0.74	*2.44*	*-0.54*
Bust * Lottery indicators	-0.0114	-0.0062	0.0106
	-0.25	*-1.08*	*0.64*
Boom * Lottery indicators	0.0439	-0.0232*	0.0013
	1.21	*-1.84*	*0.05*
Constant	-0.2676***	0.0518***	0.0092
	-6.92	*6.90*	*0.47*
Observations	451	451	451
R-squared	0.626	0.182	0.155