

# TEL-Tale Heart: **CRAFTING EFFECTIVE POLICIES TO REDUCE SPENDING**

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A Commonwealth Foundation intern in 2017, Tirzah has also worked at organizations such as the Mercatus Center doing research and data visualization. She is happy to be back working on economic and fiscal policy for the Keystone State.

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## Executive Summary

- Increases in state spending do not result in greater prosperity for state residents, across an array of measures. In fact, increased state spending can reduce economic growth.
- Reducing the relative size of the state budget is best achieved by slowing spending growth, avoiding deficits and the resulting tax increases.
- Tax and Expenditure Limits (TELs) are a popular policy to control budget growth. If done correctly, TELs can reduce state and local budget growth rates by about 1 percent.
- More effective TELs have multiple features, termed “stringency indicators,” that further define the limits on state taxes and expenditures. This analysis finds that each indicator will reduce the rate of budget growth by between 0.25 to 0.32%.
- Taxpayer Protection Act legislation—which has three indicators—could, if enacted, slow the rate of Pennsylvania budget growth by between 0.75 and 1.11%. Over the last 20 years, annual state spending growth has averaged 3.5%.
- If automatic taxpayer refunds are added to the existing bills or separate bills, the rate of spending growth could be slowed by between 1.0 and 1.48%. For context, 1% of Pennsylvania’s total operating budget for 2021–22 is almost \$970 million.
- Additional reforms to strengthen this bill and control state spending growth would include automatic refunds of revenue surpluses, a supermajority vote to raise taxes, and requiring automatic deposits into the Rainy Day Fund.

# Literature Review

## HIGHER SPENDING DOESN'T INCREASE PROSPERITY

Despite the growth in government spending—Pennsylvania's state budget has more than tripled over the last 50 years—it's unclear if this spending has had a proportional impact across different proxies for increasing prosperity.<sup>1</sup>

Internationally, government spending doesn't reduce inequality or even make people happier.<sup>2</sup> In terms of consumption poverty—which measures how much people consume to gauge the level of resource deprivation—The American Enterprise Institute found that government spending in the form of programs may have a negative impact on measures such as consumption poverty, but that endless increases may result in counterproductive incentives.<sup>3</sup> Alternatively, other studies have found that government spending at best has a marginal impact on consumption poverty or possibly a slightly negative one.<sup>4</sup>

Ultimately, consumption poverty comes from insufficient household income, which stems from either a lack of employment or a lack of high-paying employment.

A National Bureau of Economic Research paper found, "Both increases in taxes and increases in government spending have a strong negative effect on investment spending."<sup>5</sup> Investments can create businesses and jobs, while government spending does not. The St. Louis Federal Reserve found that during both high and low unemployment, the short and intermediate-term effects of government spending on job creation were minimal.<sup>6</sup> In other words, the spending had no measurable long-term impact.

These findings contradict claims that government spending is crucial and should even be expanded to maintain access to government services and maintain demand in the economy during recessions.<sup>7,8</sup>

According to research from the Heritage Foundation, however, government spending has a negative correlation to economic growth.<sup>9</sup> Therefore, reducing the scope of government is one

- 
- 1 Commonwealth Foundation, "Pennsylvania's Total Operating Budget," (2021). <https://infogram.com/2021-total-operating-budget-with-facts-1h9j6qggnqyj54g?live>.
  - 2 Renáta Madzinová, "Impact of Government Spending on Income Inequality," The Annals of the University of Oradea, (2017). <http://anale.steconomieuoradea.ro/volume/2017/n2/20.pdf>.
  - 3 Angela Rachidi, "American Exceptionalism? Five Ways Government Spending on Low-Income Children and Child Poverty is Misunderstood," American Enterprise Institute, (November 2019). <https://www.aei.org/wp-content/uploads/2019/11/American-Exceptionalism-Five-Ways-Government-Spending-on-Low-Income-Children-and-Child-Poverty-Is-Misunderstood-1.pdf>.
  - 4 Edward Anderson Maria Ana Jalles d'Orey Maren Duvendack and Lucio Esposito, "Does Government Spending Affect Income Poverty? A Meta-regression Analysis," World Development, (March 2018). <https://www.sciencedirect.com/science/article/pii/S0305750X17303200#!>.
  - 5 Oliver Blanchard and Roberto Perotti, "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output," National Bureau of Economic Research, (July 1999). [https://www.nber.org/system/files/working\\_papers/w7269/w7269.pdf](https://www.nber.org/system/files/working_papers/w7269/w7269.pdf).
  - 6 Bill Dupor, and Rodrigo Guerrero, "Government Spending and Job Creation," St. Louis Federal Reserve, (August 2, 2016). <https://www.stlouisfed.org/publications/regional-economist/uly-2016/government-spending-might-not-create-jobs-even-during-recessions>.
  - 7 Elizabeth McNichol and Nicholas Johnson, (2010). "Recession Continues to Batter State Budgets; State Responses Could Slow Recovery," Center on Budget and Policy Priorities, (February 2010). [https://www.researchgate.net/profile/Elizabeth-McNichol-2/publication/265082535\\_Recession\\_Continues\\_to\\_Batter\\_State\\_Budgets\\_State\\_Responses\\_could\\_Slow\\_Recovery/links/55ba34c908ae092e965da1a9/Recession-Continues-to-Batter-State-Budgets-State-Responses-could-Slow-Recovery.pdf](https://www.researchgate.net/profile/Elizabeth-McNichol-2/publication/265082535_Recession_Continues_to_Batter_State_Budgets_State_Responses_could_Slow_Recovery/links/55ba34c908ae092e965da1a9/Recession-Continues-to-Batter-State-Budgets-State-Responses-could-Slow-Recovery.pdf).
  - 8 Nicholas Johnson, Phil Oliff, and Erica Williams, "An Update of State Budget Cuts: At Least 46 States Have Imposed Cuts That Hurt Vulnerable Residents and Cause Job Loss," Center on Budget and Policy Priorities, (February 9, 2011). <https://www.cbpp.org/sites/default/files/atoms/files/3-13-08sfp.pdf>.
  - 9 Daniel Mitchell, "The Impact of Government Spending on Economic Growth," The Heritage Foundation, (March 15, 2005). <https://www.heritage.org/budget-and-spending/report/the-impact-government-spending-economic-growth>.



of the most consistent ways to spur economic growth.

## WHAT'S MORE IMPORTANT: TAXES OR SPENDING?

While the goal of reducing state spending to spur economic growth may be clear, getting there is not a straight-forward process. Basic household budgeting mandates that income and spending be kept in balance, but with government, for which spending isn't limited by one's salary, are spending cuts or revenue cuts the most important in reducing the size of the budget?

According to the literature, it is deficits that drive budget changes; therefore, controlling spending to avoid deficits is crucial to rein in both taxes and spending growth.

In the *Journal of Political Economy*, James M. Poterba found that government deficits do more to change budget practices than surpluses.<sup>10</sup> Additionally, taxes were more strongly impacted by deficits than spending. For example, on average, each \$100 of deficits resulted in spending cuts of almost half that amount, while taxes increased by almost \$90 over the next two years. This means that deficits are reduced disproportionately by tax increases rather than the comparatively small spending cuts in subsequent years.

Meanwhile, each \$100 in surplus resulted in a marginal increase in spending—\$3—and only \$13 in tax cuts. Furthermore, surpluses do not result in tax cuts that offset previous deficit-driven tax increases. Therefore, controlling both spending and taxes means avoiding deficits.

Once government expands spending, it is extremely difficult to rein back in. Dean Stansel and David T. Mitchell found that states that used revenue surpluses to increase spending were often not able to make needed spending cuts once the surpluses ran out. As a result, these states often suffered through financial crises during times of economic constriction.<sup>11</sup>

A paper from the National Bureau of Economic Research found that even in the presence of tax cuts, governments are unlikely to reduce spending, which leads to long-term fiscal issues.<sup>12</sup> Kansas found itself in such a situation after dramatically cutting taxes but failing to develop a spending reduction plan to account for the revenue reductions.<sup>13</sup>

Taken together, then, these studies suggest that avoiding deficits is key to financial stability. Considering that avoiding deficits through higher revenues serves to expand spending and that tax cuts fail to reduce spending, an effective policy route should focus on controlling spending to prevent deficits and limit budget growth.

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10 James M. Poterba, "State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics," The University of Chicago Press, (August 1994). <http://economics.mit.edu/files/19864>.

11 Dean Stansel and David Mitchell, "State Fiscal Crises: Are Rapid Spending Increases to Blame?" *Cato Journal*, (September 2008). [https://www.researchgate.net/profile/David-Mitchell-39/publication/236581955\\_State\\_Fiscal\\_Crises\\_Are\\_Rapid\\_Spending\\_Increases\\_to\\_Blame/links/00b7d53b4d978a91ec000000/State-Fiscal-Crises-Are-Rapid-Spending-Increases-to-Blame.pdf](https://www.researchgate.net/profile/David-Mitchell-39/publication/236581955_State_Fiscal_Crises_Are_Rapid_Spending_Increases_to_Blame/links/00b7d53b4d978a91ec000000/State-Fiscal-Crises-Are-Rapid-Spending-Increases-to-Blame.pdf).

12 Christina D. Romer and David H. Romer, "Do Tax Cuts Starve the Beast? The Effect of Tax Changes on Government Spending," National Bureau of Economic Research, (October 2007). [https://www.nber.org/system/files/working\\_papers/w13548/w13548.pdf](https://www.nber.org/system/files/working_papers/w13548/w13548.pdf).

13 Michael Mazerov, "Kansas Provides Compelling Evidence of Failure of 'Supply-Side' Tax Cuts," Center on Budget and Policy Priorities, (January 22, 2018). <https://www.cbpp.org/research/state-budget-and-tax/kansas-provides-compelling-evidence-of-failure-of-supply-side-tax-cuts>.

## TAX AND EXPENDITURE LIMITS (TELS)

Tax and Expenditure Limits (TELS) are a policy that became popular starting in the 1970s, extending into the 90s.<sup>14</sup> Early studies were not encouraging and largely discredited TELS as impactful solutions to reining in the growth of taxes and government spending.

However, these results were possibly more indicative of the variation in policies than actual shortcomings of policies themselves. TELS can vary in form, from constitutional amendments to legislation; some control spending, revenue, or both, some require a supermajority to override, some set spending caps, and others are linked to a growth formula. Describing these diverse policies as TELS doesn't explain whether a specific TEL will limit spending growth.

Information has improved in recent years with research focusing on what aspects of TELS are likely to have a meaningful impact. Michael New found that limitations initiated by citizen referendum had greater impact because they tended to be stricter than the limitations that legislatures place on themselves.<sup>15,16</sup> He measured strictness primarily by whether spending was tied to the rate of population plus inflation and whether revenues beyond the budget growth amount were returned to taxpayers.

Matt Mitchell came to a similar conclusion but took it a step further by adding to the list of policy aspects that helped limit the growth of the state budget.<sup>17</sup> He found that while some TELS can reduce spending, that is not always the case. In some high-income states, TELS are associated with an increase in spending, possibly due to the desire to spend right up to limits that vary in stringency. This phenomenon was also written about in 1996 by Ronald J. Shadbegian. He found that tying state spending to income growth results in faster growth of public spending in some states with high incomes.<sup>18</sup> However, Mitchell also found that TELS with specific characteristics could reduce spending. The key wasn't in enacting a TEL but rather in enacting a certain kind of TEL.

The reason why many TELS fail to constrain growth is due not only to weak restrictions but also conflicting political demands and budget loopholes that move spending outside of the TELS' scope. Benjamin Zycher from the American Enterprise Institute suggested that since TELS arise out of a political process and pressures, they are more likely to reflect underlying issues rather than contain them.<sup>19</sup> In other words, if lawmakers wanted to quit spending, they could do it without the enactment of a TEL. Additionally, Gary A. Wagner and Russell S. Sobel found that states with spending constraints were more likely to adopt budget stabilization or rainy-day funds with weak withdrawal rules.<sup>20</sup> In practice, this could act as a budgetary workaround that ultimately rejects the spirit of spending constraints.

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14 Tax Policy Center. "What are tax and expenditure limits?," (May 2020). <https://www.taxpolicycenter.org/briefing-book/what-are-tax-and-expenditure-limits>.

15 Michael J. New, "Limiting Government through Direct Democracy: The Case of State Tax and Expenditure Limitations," Cato Institute, (December 13, 2001). <https://www.cato.org/publications/policy-analysis/limiting-government-through-direct-democracy-case-state-tax-expenditure-limitations>.

16 Michael J. New, "U.S. State Tax and Expenditure Limitations: A Comparative Political Analysis," State Politics & Policy, (2010). <https://www.jstor.org/stable/27867132?read-now=1&seq=1>.

17 Matt Mitchell, "TEL It Like It Is: Do State Tax and Expenditure Limits Actually Limit Spending?," Mercatus Center, (December 2010). <https://www.mercatus.org/system/files/TEL%20It%20Like%20It%20Is.Mitchell.12.6.10.pdf>.

18 Ronald J. Shadbegian, "Do Tax and Expenditure Limitations Affect the Size and Growth of State Government?," Contemporary Economic Policy, (January 1996). <http://cob.jmu.edu/doylejm/EC%20485docs/stategovernment2007.pdf>.

19 Benjamin Zycher, "State and Local Spending: Do Tax and Expenditure Limits Work?," American Enterprise Institute, (May 2013). [https://www.aei.org/wp-content/uploads/2013/05/-state-and-local-spending-do-tax-and-expenditure-limits-work\\_152855963641.pdf](https://www.aei.org/wp-content/uploads/2013/05/-state-and-local-spending-do-tax-and-expenditure-limits-work_152855963641.pdf).

20 Gary A. Wagner and Russell S. Sobel, (2006). "State Budget Stabilization Fund Adoption: Preparing for the Next Recession or Circumventing Fiscal Constraints?," Public Choice, (January 2006). <https://link.springer.com/article/10.1007/s11127-006-7752-x>.

Barry Poulson, a professor from the University of Colorado at Boulder, isolated many of the same indicators that Mitchell did but also found that linking limits to other budget rules—primarily a balanced budget requirement, which Pennsylvania has—was key to getting these policies to work as intended.<sup>21</sup> He also found that states with TELs tend to experience lower tax increases during economic downturns than those without.

TELs represent a one-time attempt to control a future situation. Despite initial efforts, as the political landscape changes, workarounds are found. One study found that increases in charges and fees were a favorite workaround after TEL implementation.<sup>22</sup> The same study found only one successful TEL—the Taxpayer Bill of Rights (TABOR) in Colorado. Therefore, if crafted correctly, TELs can curb the growth of state finances.

It is worth noting, however, that while TABOR is widely considered a success, Proposition 117—which passed in 2020—required that fee-funded state enterprises be subject to voter approval, implying that the state may not have entirely avoided workarounds after all.<sup>23</sup> Poulson was on to something when viewing TELs as one part of an overall budget process.

## TALE OF TWO TELs: CULTURE AND LEGISLATION

**Colorado:** The TEL in Colorado is called the Taxpayer Bill of Rights (TABOR) and contains two primary characteristics. First, it requires a public vote to approve any increase in taxation, and second, it limits revenue growth over time and requires surpluses to be refunded back to constituents.<sup>24</sup> This bill is largely hailed as a success, and Pennsylvania’s TPA is partially modeled after it.

**California:** California had one of the first state TELs, Proposition 13, which passed in 1978 and is credited with helping to lead a tax revolt in other states.<sup>25</sup> This TEL is narrow in focus and only restricts property taxes by limiting the rate to 1% and assessing this rate based on the purchase price and not on the property’s current value.

**Rankings of stringency & growth rates:** According to data from Mitchell, both states contain identical rankings in terms of the number of TEL stringency characteristics,<sup>26</sup> with one exception related to the power of the residents. In California, tax increases can occur with a two-thirds vote by the legislature, and other revenue increases can occur with a simple majority. In Colorado, no tax policy change can occur without the vote of the people.

21 Barry W. Poulson, “Tax and Spending Limits: Theory, Analysis, and Policy,” Independence Institute, (January 2004). [https://www.researchgate.net/profile/Barry-Poulson/publication/242678725\\_Tax\\_and\\_Spending\\_Limits\\_Theory\\_Analysis\\_and\\_Policy/links/53f494dc0cf22be01c3ed05b/Tax-and-Spending-Limits-Theory-Analysis-and-Policy.pdf](https://www.researchgate.net/profile/Barry-Poulson/publication/242678725_Tax_and_Spending_Limits_Theory_Analysis_and_Policy/links/53f494dc0cf22be01c3ed05b/Tax-and-Spending-Limits-Theory-Analysis-and-Policy.pdf).

22 Thad Kousser, Mathew D. McCubbins and Ellen Moule, “For Whom the TEL Tolls: Can State Tax and Expenditure Limits Effectively Reduce Spending?,” University of California, San Diego. <https://bit.ly/3wGEaoS>.

23 Legislative Council of the Colorado General Assembly, (2020). “2020 State Ballot Information,” (September, 2020). [https://leg.colorado.gov/sites/default/files/blue\\_book\\_english\\_for\\_web\\_2020\\_1.pdf](https://leg.colorado.gov/sites/default/files/blue_book_english_for_web_2020_1.pdf).

24 Building a Better Colorado, “Understanding the TABOR Amendment,” <https://buildingabettercolorado.org/understanding-tabor/>.

25 Richard C. Auxier, Tracy Gordon, and Kim S. Rueben, “Four Decades After Proposition 13’s Tax Revolt, Will California (Split) Roll It Back with Proposition 15?,” Tax Policy Center, (October 26, 2020). <https://www.taxpolicycenter.org/taxvox/four-decades-after-proposition-13s-tax-revolt-will-california-split-roll-it-back-proposition>.

26 Details on the stringency index can be found in the discussion on Test 3.

**Culture of spending for both states:** In the literature, Colorado's TEL is largely hailed as a success, while California's is pointed to as a failure. These two TELs should be comparable based on stringency; however, the current culture of spending is very different.

In California, Proposition 13 sought to alter the way property taxes are collected by restructuring the assessment process. Essentially, this reform would have resulted in revenue/tax increases between \$6.5 and \$11.5 billion.<sup>27</sup> Even though this reform didn't pass in 2020, it stands in contrast to efforts in Colorado. In the 2020 election, Colorado passed Proposition 117, which subjected state fee increases to voter approval, which will in effect further limit the state's ability to circumvent TABOR.<sup>28</sup>

These examples further emphasize the need to both address the state's culture of spending and the necessary holistic approach needed for budget reform.

## Analysis and Findings

The following analysis focuses on the extent to which TELs can restrict the size of government spending.

### DATASET

The dataset was constructed from three primary sources and is a pooled sample of all 50 U.S. states spanning 1970 to 2018 measured on an annual basis, including measures of state and local government expenditures, personal income, population, and TELs and their characteristics. All dollar-denominated values are expressed in real 2019 dollars.

### STATE AND LOCAL EXPENDITURES

Following Matt Mitchell, annual spending data were collected for the years covering 1977 to 2018 from the Census of Governments and Annual Survey of State and Local Government Finances. To extend the sample backwards to 1970, the dataset was combined with annual data from the Census Bureau's Governmental Finances series (U.S. Bureau of the Census, Various Years).<sup>29</sup> The Governmental Finances data are collected by the Census Bureau through the same procedures as the previously mentioned Census of Governments and Annual Survey of

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27 Richard C. Auxier, Tracy Gordon, and Kim S. Rueben, "Four Decades After Proposition 13's Tax Revolt, Will California (Split) Roll It Back with Proposition 13?" Tax Policy Center, (October 26, 2020). <https://www.taxpolicycenter.org/taxvox/four-decades-after-proposition-13s-tax-revolt-will-california-split-roll-it-back-proposition>.

28 Brian Eason, "Proposition 117 explained: Colorado voters would have more control over government fees," The Colorado Sun, <https://coloradosun.com/2020/10/05/proposition-117-explained-enterprise-fees-colorado/>.

29 U.S. Bureau of the Census, (Various Years). "Governmental Finances," U.S. Bureau of the Census.

State and Local Government Finances and are directly comparable over time.<sup>30</sup> These data are reported in nominal terms and were inflated to real 2019 dollars using the Personal Consumption Expenditures (PCE) price index from the Bureau of Economic Analysis (BEA).

One caveat of the Census Bureau data is worthy of note. While the Census Bureau data have complete coverage for all governments in all years and in years ending in 2 and 7 (the Census of Governments years), coverage for local governments is less than complete in the interval years. Changes in local government spending estimates are therefore subject to sampling error in the noncensus years and should be treated with appropriate caution.

## **INCOME AND POPULATION**

Annual income and population data were collected from the Bureau of Economic Analysis (BEA).<sup>31</sup> These data provide annual estimates of personal income and population by state covering the full 1970–2018 sample. Specifically, the data include estimated personal income in millions and total population by state and year. Like the governmental expenditures data, personal income is reported in nominal dollars and inflated to real 2019 dollars using PCE.

## **TAX AND EXPENDITURE LIMITS**

Data on states' adoption of TELs are taken from Mitchell. The data include TEL adoption years and various characteristics about the TELs themselves, that is, the method of implementation, what the limits affect, etc. These data were reported in the appendix, table 1 of his paper.<sup>32</sup>

## **DATASET CONSTRUCTION**

The final dataset was constructed by merging each dataset. First, the Census Bureau data on state and local government expenditures were merged with income and population data from the BEA. Using the BEA personal income measure as a denominator, the state and state-plus-local expenditures data were converted into shares of state personal income following Mitchell. Finally, data on TEL adoption was merged into the final dataset and coded as a dummy variable equal to one for each year following TEL adoption.

## **TELS AND SHARE OF PERSONAL INCOME: TESTS 1 & 2**

Three tests were run to determine the impact of TELs. The first looked at the impact of TELs and state spending as a share of personal income. The test failed to detect a statistically significant difference in state spending across TEL and non-TEL states. More detailed explanations and findings are included in the appendix.

To break down the characteristics of TELs and their impact on spending, the next test measured

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30 These data are not available in a digitized form and were manually entered and checked for validity.

31 Bureau of Economic Analysis. (1970–2018). "Population and income, table SAINC4," Bureau of the Economic Analysis.

32 Matthew Mitchell, "TEL It Like It Is: Do state Tax and Expenditure Limits Actually Limit spending?," (December 2010). <https://www.mercatus.org/publications/government-spending/tel-it-it>.

different TEL spending formulas and their impact on state and local expenditures as a share of personal income. First, the TELs were broken down into their growth rate formula, which included limits based on inflation plus population growth, income growth, income share of spending, and a category for other measurements. None of these measurements for TELs achieved significance when measured by state spending as a share of personal income. When measuring spending by local governments, some TELs showed a positive association, but at a nonsignificant level.

To further refine these findings, a second portion of the test involved creating a TEL stringency index from additional factors not included in the growth formula previously tested. This index is computed from the following factors: adopted by referendum or constitutional convention, adopted by initiative, adopted by constitutional amendments, applies to spending (as opposed to revenue), requires a supermajority for override, automatically refunds surpluses, and prohibits unfunded mandates. The index itself ranges from 0 to 6. These factors were taken from Mitchell's work on what makes a successful TEL.

The stringency index was used to measure the impact of TEL stringency on state and local spending as a share of personal income. The findings show no significant association between more stringent TEL laws and changes in government spending as a share of states' income. Further information can be found in the appendix and in tables 1, 2, 3, and 4.

### TELS AND SLOWING GOVERNMENT SPENDING GROWTH: TEST 3

One final examination of TELs' impact on government spending concerns whether they slow government spending growth. Following the public finance literature, this test amounts to regressing the growth in per capita state spending and the sum of state and local government expenditures as a measure of a TEL's adoption and stringency.<sup>33</sup>

First, Table 5 shows fixed effects regression estimates of TELs' impact on state and local spending growth. Considering only growth in expenditures by state governments, the baseline dummy variable model in column 1 shows that TEL states had lower average growth in state government spending of around -0.6%. However, this estimate achieves significance only at the 10% level, which isn't considered impactful. After controlling for personal income and the interaction between TEL adoption and income, this estimate increases in magnitude to around -0.7% in column 2, although it falls out of significance.

Adding in expenditures by local governments in columns 3 and 4, the regression estimates show a strong, negative association between TELs and spending growth. The coefficient estimates suggest that TEL states experienced lower expenditure growth of around 1% following TEL adoption compared to non-TEL states. These results are statistically significant at the 1% level in the baseline dummy variable model and at the 5% level after controlling for personal income and its interaction with the TEL dummy.

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33 Growth refers to the log change in per capita expenditures, that is,  $\Delta \ln(Y_{it}) = \ln(Y_{it}) - \ln(Y_{it-1})$ .



**TABLE 5. TEL ADOPTION AND STATE AND LOCAL EXPENDITURE SHARES, TWO-WAY FIXED EFFECTS ESTIMATIONS**

Table reports two-way fixed effects regression results for the impact of TEL adoption on state and local government expenditure per capita growth. Growth is defined as the log difference in each per capita spending measure multiplied by 100. Columns 1 and 3 report simple differences in differences estimations. Columns 2 and 4 replicate the baseline specifications in Mitchell without control variables. Each specification includes state and year fixed effects. Robust standard errors are clustered at the state level and shown in parentheses.

	[1] State Exp. PC Growth	[2] State Exp. PC Growth	[3] State + Local Exp. PC Growth	[4] State + Local Exp. PC Growth
TEL Dummy	-0.646*	-0.742	-1.009***	-0.945**
	-0.384	-0.504	-0.305	-0.429
Per Capita Income (000s)		-0.023		0.052*
		-0.037		-0.029
TEL Dummy X Per Capita Income (000s)		0.004		-0.001
		-0.014		-0.01
Num.Obs.	2,400	2,400	2,400	2,400
R2 Adj.	0.41	0.41	0.62	0.62
R2 Within	0	0	0	0.01

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

Sources: Calculations using data from the Census Bureau, Bureau of Economic Analysis, and Mitchell.

Second, estimates in Table 6 replace the TEL dummy variables with the TEL index described above as a test of TEL stringency. The results for state government spending growth are mixed in terms of statistical significance. Looking only at the TEL index in column 1, the regression estimates show a negative yet insignificant association between more stringent TEL laws and per capita state government expenditure growth. After controlling for income, the coefficient estimates enter significance at the 10% level, showing that an increase in the stringency index by one point is associated with a 0.27% lower average growth in state expenditures compared to non-TEL states. Moving across to state and local expenditure growth, the regression estimates in columns 3 and 4 show that a higher score on the TEL stringency index is associated with lower average growth in expenditures relative to non-TEL states. These estimates amount to lower expenditure growth of between 0.25 model and 0.32 percentage points after controlling for income. These findings reach statistical significance.

**TABLE 6. TEL ADOPTION INDEX AND STATE AND LOCAL PER CAPITA EXPENDITURE GROWTH, TWO-WAY FIXED EFFECTS ESTIMATIONS**

Table reports two-way fixed effects regression results for the impact of the TEL index described in Mitchell on state and local government expenditure per capita growth. Growth is defined as the log difference in each per capita spending measure multiplied by 100. Columns 1 and 3 report simple differences in differences estimations. Columns 2 and 4 replicate the baseline specifications in Mitchell without control variables. Each specification includes state and year fixed effects. Robust standard errors are clustered at the state level and shown in parentheses.

	[1] State Exp. PC Growth	[2] State Exp. PC Growth	[3] State + Local Exp. PC Growth	[4] State + Local Exp. PC Growth
TEL Index	-0.148	-0.274*	-0.254**	-0.318**
	-0.12	-0.151	-0.111	-0.14
Per Capita Income (000s)		-0.02		0.055
		-0.041		-0.034
TEL Index X Per Capita Income (000s)		0.006		0.003
		-0.004		-0.003
Num.Obs.	2,400	2,400	2,400	2,400
R2 Adj.	0.41	0.41	0.62	0.62
R2 Within	0	0	0	0

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

Sources: Calculations using data from the Census Bureau, Bureau of Economic Analysis, and Mitchell.

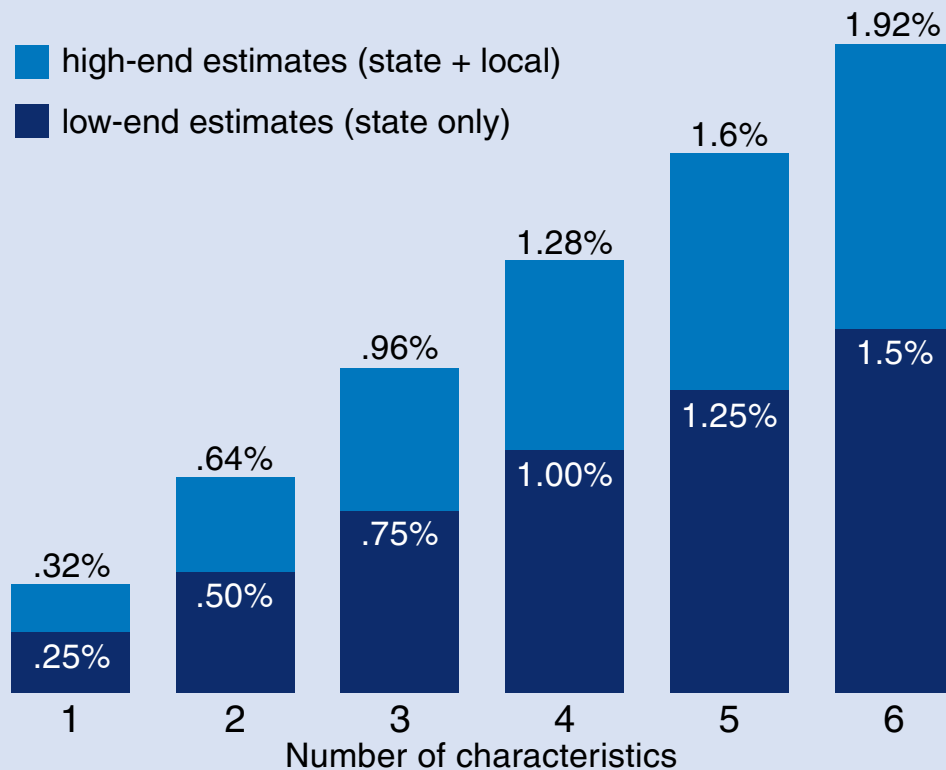
## Discussion

The prior analyses used state-level panel data on state and local government expenditures to empirically test the correlation between the adoption of TEL laws and governmental expenditures—both as a share of state personal income and per capita growth. Using a series of fixed effects regressions, the analyses found limited statistical evidence to suggest that TELs have an impact on state and local government expenditures when measured as a share of states' income. These results hold for various TEL formulas and an index of TEL stringency. However, an examination of government expenditure growth per capita shows that the adoption of TEL laws was associated with lower average expenditure growth rates for total state and local expenditures. While these estimates were statistically significant, the economic magnitudes of these estimates were relatively small—TEL adoption was associated with lower average growth rates of around 1 percentage point when compared to non-TEL states. In other words, TELs don't reduce spending, but they do slow it. This means that long-term spending is reduced from what would have occurred without them.

### CHARACTERISTICS OF STRINGENT TAX AND EXPENDITURE LIMITS

- adoption by either a referendum or constitutional convention
- enacted constitutionally
- applies to spending
- requires a supermajority for override
- automatically refunds surpluses
- prohibits unfunded mandates

- high-end estimates (state + local)
- low-end estimates (state only)



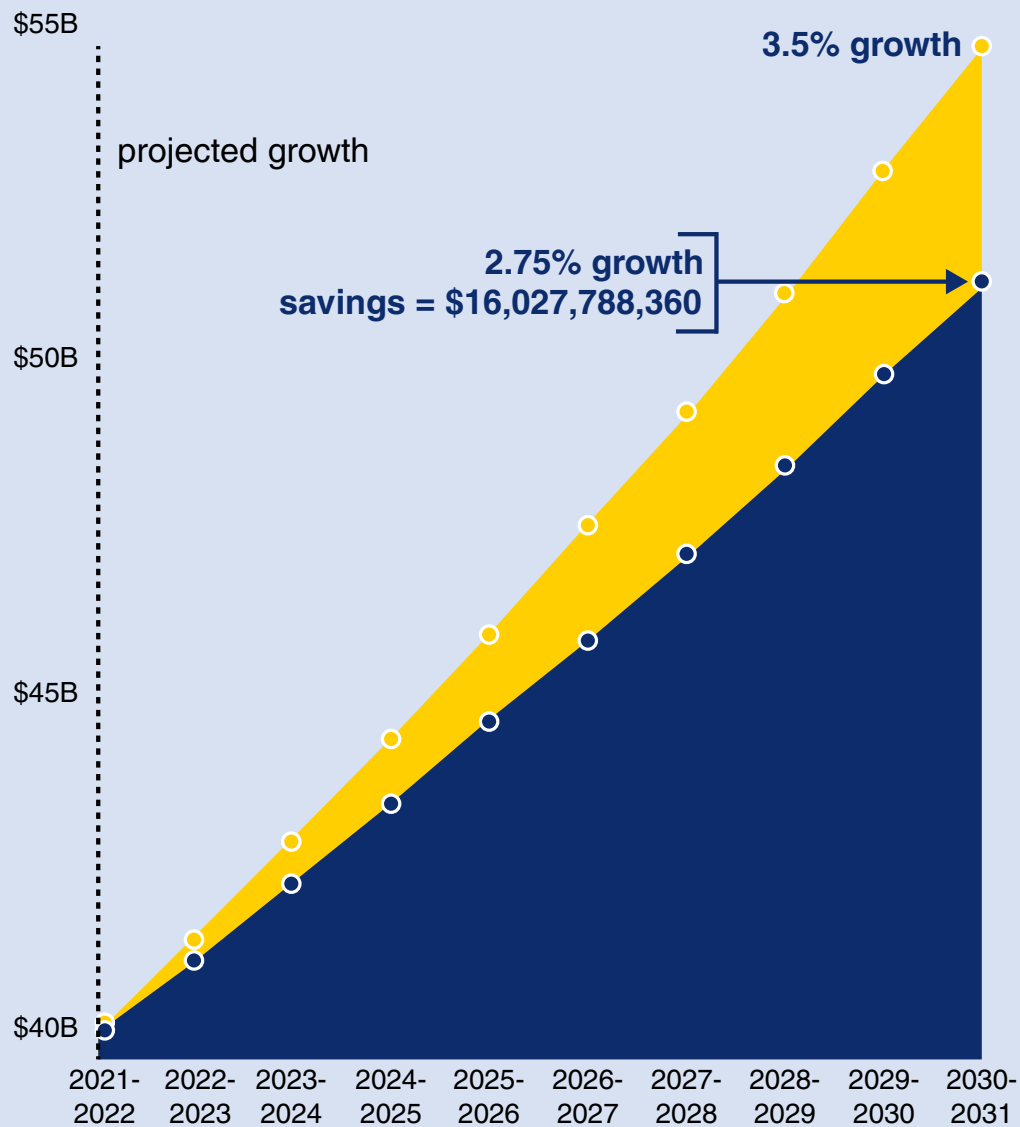
### Takeaways for Policy Makers to Promote Prosperity

- Lowering state spending is key to preventing tax increases, encouraging economic growth, and ultimately increasing prosperity for those that call Pennsylvania home.
- Pennsylvania can expect to slow budget growth to around 2.5% instead of 3.5% by passing the TPA.
- Compatible reforms such as refunding surplus revenues will strengthen the TPA and push the expected reduction in growth of the budget to over 1%.
- Additional bills to consider include:
  - Supermajority to raise taxes
  - Mandatory deposits into the rainy-day fund

The literature and preceding economic analysis together show that TELs can help to control a state's budget, but they are by no means a panacea. The stringency in TELs helps increase the policy's impact. Since 2000, Pennsylvania has had an annual budget growth of 3.5%. The TPA can help bring this rate down to 2.75%.<sup>34</sup>

### PROJECTED GENERAL FUND GROWTH

Compared to an average growth rate of 3.5%, the TPA could generate a cumulative savings of over \$16 billion by 2030. This savings is roughly equivalent to total education appropriations from the General Fund in 2021-22.



<sup>34</sup> This estimate is based solely on state funds and doesn't account for local reductions.

Based on the findings that a 1-point increase in stringency would result in a 0.25 to .37% lower rate of growth and that the TPA comes in at a 3 on the stringency index, Pennsylvania lawmakers can estimate a decrease in the budget growth rate of almost 1%. To make the bill even stronger, lawmakers can consider adding a ban on unfunded mandates and automatic refunds of revenue surpluses.

How these laws are implemented, however, matters just as much as how they are written. For Pennsylvania, pitfalls could include the Legislature continuing with supplemental appropriations that aren't included in the formula, moving funds out of the general fund to avoid the limit, and a general culture that prioritizes spending over fiscal responsibility. Passing a TEL can be part of a transformation away from this, and other budget process reforms can add additional support.

## ALTERNATIVE POLICY REFORMS

While the goal of reducing tax burdens and state spending is clear, specifying policies that result in these outcomes is not straight forward. Solely relying on TELs is not the answer; but it is still not clear which policies are most likely to result in the reduction of state budgets.

Elements that might appear disconnected to spending are shown to have impacts. For example, line item vetoes can reduce spending.<sup>35</sup> Stringent balanced-budget rules have the potential to reduce spending, but often have other consequences.<sup>36</sup> Additionally, use of optimistic revenue projections and conservative spending estimates result in “unforeseeable” challenges and can be used to justify spending above and beyond projections.<sup>37</sup>

Brian G. Knight found that supermajority requirements to raise taxes have been successful in significantly reducing tax rates.<sup>38</sup> Others found similar results, although these impacts may fade a decade after enactment.<sup>39</sup> Alternatively, Meagan M. Jordan and Kim U. Hoffman found that supermajority requirements may not be particularly impactful.<sup>40</sup> However, Jac C. Heckleman and Keith L. Dougherty found that the impact of a supermajority requirement tends to be different depending on the type of tax.<sup>41</sup> Taxes with a narrow base tended to be reduced, while broad-based taxes were largely unimpacted.

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35 Robert Krol, “A Survey of the Impact of Budget Rules on State Taxation, Spending, and Debt,” Cato Institute, (1997). <https://www.cato.org/sites/cato.org/files/serials/files/cato-journal/1997/1/cj16n3-2.pdf>.

36 Matthew Mitchell and Nick Tuszynski, “Institutions and State Spending: An Overview,” The Independent Review, (2012). [https://www.independent.org/pdf/tir/tir\\_17\\_01\\_03\\_mitchell.pdf](https://www.independent.org/pdf/tir/tir_17_01_03_mitchell.pdf).

37 Alberto Alesina and Roberto Perotti, “Fiscal Discipline and the Budget Process,” American Economic Review, (May 1996). [http://files.spazioweb.it/aruba20508/file/paper\\_aer\\_1996\\_fiscaldisciplineandthebudgetprocess\\_1.pdf](http://files.spazioweb.it/aruba20508/file/paper_aer_1996_fiscaldisciplineandthebudgetprocess_1.pdf).

38 Brian G. Knight, “Supermajority Voting Requirements for Tax Increases: Evidence from the States,” Journal of Public Economics, (2000). <https://cpb-us-w2.wpmucdn.com/sites.brown.edu/dist/d/75/files/2019/05/Supermajority-Voting-Requirements-for-Tax-Increases.pdf>.

39 Soomi Lee, (2018). “Do States Circumvent Supermajority Voting Requirements to Raise Taxes,?” State Politics and Policy Quarterly, (2018). [https://www.researchgate.net/profile/Soomi-Lee/publication/316281216\\_Do\\_States\\_Circumvent\\_Supermajority\\_Voting\\_Requirements\\_to\\_Raise\\_Taxes/links/5b4cd3580f7e9b240fe4ee86/Do-States-Circumvent-Supermajority-Voting-Requirements-to-Raise-Taxes.pdf](https://www.researchgate.net/profile/Soomi-Lee/publication/316281216_Do_States_Circumvent_Supermajority_Voting_Requirements_to_Raise_Taxes/links/5b4cd3580f7e9b240fe4ee86/Do-States-Circumvent-Supermajority-Voting-Requirements-to-Raise-Taxes.pdf)

40 Meagan M. Jordan and Kim U. Hoffman, “The Revenue Impact of State Legislative Supermajority Voting Requirements,” Midsouth Political Science Review, (2009). [https://www.researchgate.net/profile/Meagan-Jordan/publication/268055280\\_The\\_Revenue\\_Impact\\_of\\_State\\_Legislative\\_Supermajority\\_Voting\\_Requirements/links/5705482008ae44d70ee310d3/The-Revenue-Impact-of-State-Legislative-Supermajority-Voting-Requirements.pdf](https://www.researchgate.net/profile/Meagan-Jordan/publication/268055280_The_Revenue_Impact_of_State_Legislative_Supermajority_Voting_Requirements/links/5705482008ae44d70ee310d3/The-Revenue-Impact-of-State-Legislative-Supermajority-Voting-Requirements.pdf).

41 Jac C. Heckelman, and Keith L. Dougherty, “Majority Rule versus Supermajority Rules: Their Effects on Narrow and Broad Taxes,” Public Finance Review, <http://heckeljc.sites.wfu.edu/papers/published/PFR2010.pdf>.

Requirements to make deposits into a rainy-day fund can help reduce fiscal stress, which could prevent deficits that frequently result in tax increases.<sup>42</sup> While ideal rainy-day balances aren't yet established, some experts estimate that they should be maintained at roughly 15% to 18% of annual spending.<sup>43</sup> In Pennsylvania, for example, the guidance for school district reserve funds is at least 10%.<sup>44</sup>

Either way, Pennsylvania is far below recommendations. Prior to the deposit in the 2021-22 budget, the state had a balance equal to only 1% of spending. With the addition of this year's deposit of \$2.5 billion<sup>45</sup> the balance is still only 3% or just under 11 days.<sup>46</sup> Furthermore, strict deposit and withdrawal rules can contribute to spending volatility,<sup>47</sup> and there is evidence adequate rainy-day funds suppress spending only in the short-term.<sup>48</sup>

## SUPPLEMENTAL APPROPRIATIONS

### SUPPLEMENTAL APPROPRIATIONS = OVERSPENDING

Supplemental appropriation is another term for overspending. In theory, this practice covers unforeseeable expenses, but it has become a normal part of the state budget process.

### PENNSYLVANIA HAS A PATTERN OF OVERSPENDING

- Since 2010, overspending has occurred in eight of 11 budgets, totaling over \$2 billion.

### DISGUISED BUDGET GROWTH

- Supplemental appropriations obfuscate total budget growth. When budgets are passed, growth rates are often based on the prior years' enacted budgets and supplementals, which conceals the true rate of growth.
- For budget year 2020-21, total overspending from the General Fund was nearly \$850 million.

42 James W. Douglas and Keith Gaddie, "State Rainy Day Funds and Fiscal Crises: Rainy Day Funds and the 1990-1991 Recession Revisited," Public Budgeting & Finance, (2002). [https://www.researchgate.net/profile/James-Douglas-28/publication/228266276\\_State\\_Rainy\\_Day\\_Funds\\_and\\_Fiscal\\_Crises\\_Rainy\\_Day\\_Funds\\_and\\_the\\_1990-1991\\_Recession\\_Revisited/links/5cf63e6292851c4dd02727b9/State-Rainy-Day-Funds-and-Fiscal-Crises-Rainy-Day-Funds-and-the-1990-1991-Recession-Revisited.pdf](https://www.researchgate.net/profile/James-Douglas-28/publication/228266276_State_Rainy_Day_Funds_and_Fiscal_Crises_Rainy_Day_Funds_and_the_1990-1991_Recession_Revisited/links/5cf63e6292851c4dd02727b9/State-Rainy-Day-Funds-and-Fiscal-Crises-Rainy-Day-Funds-and-the-1990-1991-Recession-Revisited.pdf).

43 Bob Zahradnik and RoseRibeiro, "Heavy Weather: Are State Rainy-Day Funds Working?" Center on Budget and Policy Priorities, (May 3, 2003). <https://www.cbpp.org/archiveSite/5-12-03sfp.pdf>.

44 Pennsylvania Department of the Auditor General, "Auditor General DePasquale Says Poor Budget Planning Led to Blackhawk School District's Nearly Depleted General Fund Balance," (April 11, 2017). <https://www.paauditor.gov/press-releases/auditor-general-depasquale-says-poor-budget-planning-led-to-blackhawk-school-district's-nearly-depleted-general-fund-balance>.

45 Senate Appropriations Committee Fiscal Note, "House Bill 1348," (2021). <https://www.legis.state.pa.us/WU01/LI/BI/SFN/2021/0/HB1348P1932.pdf>

46 Calculated based on total operating budget.

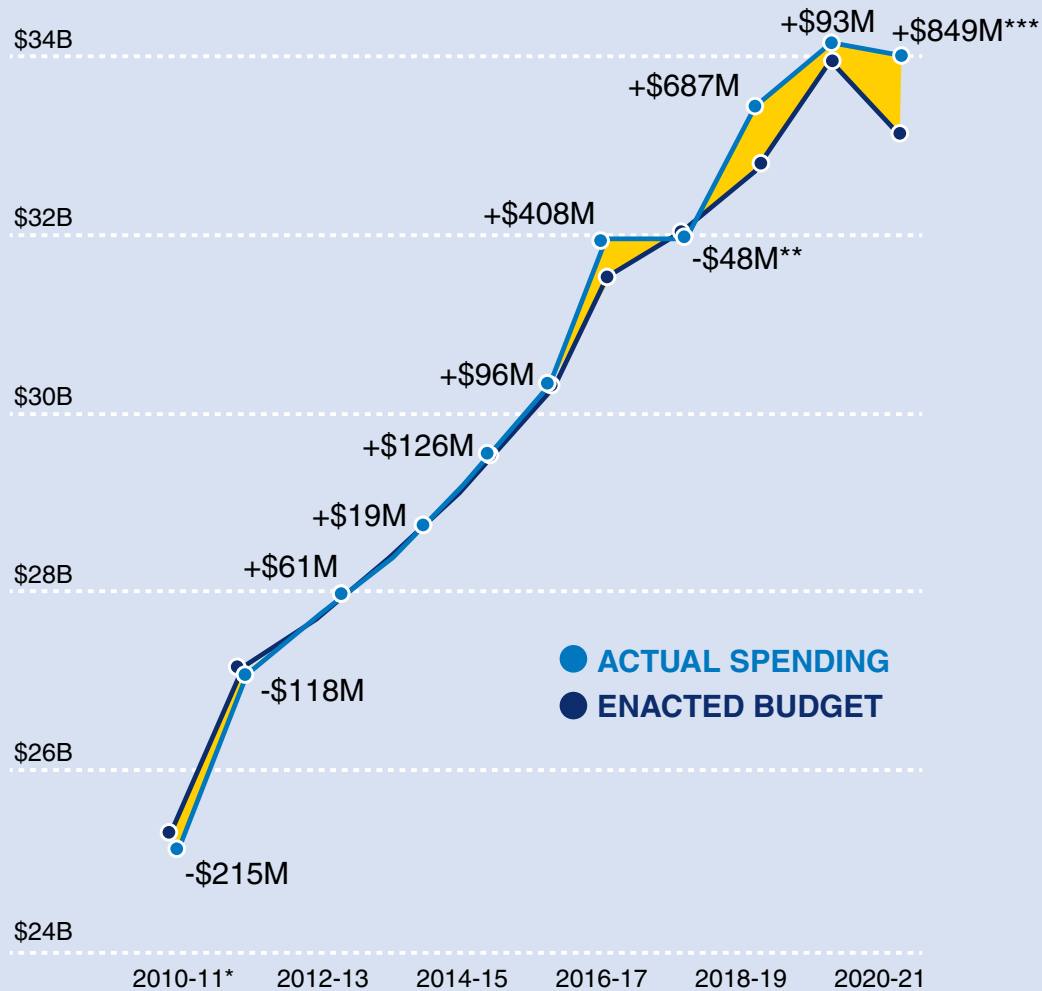
47 Antonio Fatás and Ilian Mihov, (2005). "The Macroeconomic Effects of Fiscal Rules in the U.S. States," Journal of Public Economics, (2005). <https://perso.univ-rennes1.fr/sebastien.pommier/fatasmihov2.pdf>.

48 James M. Poterba, "Budget Institutions and Fiscal Policy in the U.S. States," National Bureau of Economic Research, (February 1996). [https://www.nber.org/system/files/working\\_papers/w5449/w5449.pdf](https://www.nber.org/system/files/working_papers/w5449/w5449.pdf).



## PENNSYLVANIA CONSISTENTLY OVERSPENDS

Since 2010, supplemental appropriations have totaled over **\$2 billion**.



### Sources:

Enacted Appropriation numbers are taken from the budget line item appropriations or fiscal note 2020-21, 2019-20, 2018-19, 2017-18, 2016-17, 2015-16, 2014-15, 2013-14, 2012-13, 2011-12, 2010-11.

Actual Expenditure numbers are taken from the Governor's Executive Budget, Summary by Fund, General Fund, Financial Statement, Actual.

\*Excludes \$2,754,505,000 in federal ARRA funds

\*\*Note this does not include the 6 billion in line item vetoes that were later restored.

\*\*\*Includes a \$5.155 million reduction in "executive authorizations"

While the perfect combination of policies remains unclear, what is clear is that TELs can play an important role in reforming state budgets. Additionally, there is a litany of potential policies that can help reduce spending growth and increase transparency in the budgeting process.

## APPENDIX

### TEST 1: CORRELATION BETWEEN TEL ADOPTION AND STATE SPENDING AS A SHARE OF PERSONAL INCOME

Following Mitchell, the analyses perform a series of fixed effects estimations.<sup>49</sup> In equation (1), the dependent variable  $Y_{it}$  is the share of government expenditures relative to total personal income in state  $i$  in year  $t$ . Government expenditures may refer to either state government expenditures or the sum of state and local government expenditures.  $D_{it}$  is an indicator variable equal to one for years in which state  $i$  has an active TEL policy,  $\alpha_i$  and  $\tau_t$  represent state and year fixed effects, and  $\varepsilon_{it}$  is a mean zero error term. Standard errors are clustered by state to allow for arbitrary autocorrelation in the errors Petersen.<sup>50</sup>

$$Y_{it} = \alpha_i + \tau_t + \delta D_{it} + \varepsilon_{it} \quad (1)$$

Following the empirical literature on TELs, researchers often interact the TEL policy dummy with a measure of state personal income (Shadbegian, 1996). This amounts to estimating the following regression specification:

$$Y_{it} = \alpha_i + \tau_t + \delta D_{it} \times \text{IncomePC}_{it} + \beta \text{IncomePC}_{it} + \varepsilon_{it}, \quad (1)$$

where  $\text{IncomePC}_{it}$  is per capita income. Shadbegian justifies this specification on the basis that states implementing TELs frequently link growth in government spending to income growth.<sup>51</sup>

### ESTIMATION RESULTS

Following Shadbegian and Mitchell, fixed effects regression results below estimate the effects of TELs on state and local government expenditures as a share of income. Prior to evaluating the regression estimates, Table 1 summarizes each of the variables in the final dataset and their means and standard deviations broken down for TEL adopters and non-TEL states. On average, both TEL and non-TEL states possess similar shares of both state and state and local shares of personal income of around 9% and 18%, respectively. The difference in both averages is both small in magnitude of around -0.1% and statistically insignificant in each case (columns 5 and 6). This is also true of other relevant control variables, such as population and per capita income.

49 Matthew Mitchell, "TEL It Like It Is: Do state Tax and Expenditure Limits Actually Limit spending?," Mercatus Center, (December 2010). <https://www.mercatus.org/publications/government-spending/tel-it-it>.

50 48 Mitchell A. Petersen, "Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches," National Bureau of Economic Research, <https://www.nber.org/papers/w11280>.

51 Ronald J. Shadbegian, "Do Tax and Expenditure Limitations Affect Local Government Budgets? Evidence From Panel Data," Public Finance Review, (March 1, 1988). <https://journals.sagepub.com/doi/10.1177/109114219802600202>.

**TABLE 1. DESCRIPTIVE STATISTICS ABOUT STATE AND LOCAL GOVERNMENT EXPENDITURE SHARES OF STATE PERSONAL INCOME**

Table shows descriptive statistics for variables used in each regression specification. Data on state and local government expenditures are from the Census Bureau and the Government Financial Database (GFD) compiled by Pierson et al.<sup>52</sup> Income and population data are from the Bureau of Economic Analysis (BEA). TEL adoption and their characteristics are sourced from the Mitchell appendix.

	Non-Adopter (N=1029)		TEL Adopter (N=1421)			
	(1) Mean	(2) Std. Dev.	(3) Mean	(4) Std. Dev.	(5) Diff. in Means	(6) p-value
State Share	9.30	2.80	9.20	4.00	-0.10	0.90
State + Local Share	18.20	3.60	18.10	4.60	-0.10	0.90
Population (000s)	4384.2	4649.9	5928.7	6490.2	1544.5	0.3
Per Capita Income (000s)	18.2	15.6	18.0	15.4	-0.1	0.9
TEL Index	0.00	0.00	2.00	1.90	2.00	0.00
Supermaj. or Public Vote Override	0.00	0.00	0.40	0.50	0.40	0.00
Inflation + Pop. Basis	0.00	0.00	0.10	0.30	0.10	0.00
Income Growth Basis	0.00	0.00	0.30	0.50	0.30	0.00
Income Share Basis	0.00	0.00	0.20	0.40	0.20	0.00
Other Basis	0.00	0.00	0.10	0.30	0.10	0.00

Sources: Calculations using data from the Census Bureau, Bureau of Economic Analysis, and Mitchell

52 Kawika Pierson, Michael L. Hand, and Fred Thompson, "The Government Finance Database: A Common Resource for Quantitative Research in Public Financial Analysis," (June 24, 2015). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4479543/>.

## General Findings

The main regression results are summarized in Table 2 and examine the correlation between TEL adoption and state government's expenditures relative to personal income. Columns 1 and 2 first compare state expenditures as a share of personal income in TEL states versus non-TEL states. In both estimations—one using a simple TEL dummy variable and the next using a TEL dummy variable interacted with per capita personal income—the regressions fail to detect a statistically significant difference in state spending across TEL and non-TEL states. This result persists when adding in local spending, as shown in columns 3 and 4. In each regression, the results show a positive partial correlation between TEL law adoption and government spending, neither the coefficients on the TEL dummy nor its interaction with per capita income obtain statistical significance.

**TABLE 2. TEL ADOPTION AND STATE AND LOCAL EXPENDITURE SHARES, TWO-WAY FIXED EFFECTS ESTIMATIONS**

Table reports two-way fixed effects regression results for the impact of TEL adoption on state and local government expenditure shares of state personal income. Columns 1 and 3 report simple differences in differences estimations. Columns 2 and 4 replicate the baseline specifications in Mitchell without control variables. Each specification includes state and year fixed effects. Robust standard errors are clustered at the state level and shown in parentheses.

	[1] State Exp. PC Growth	[2] State Exp. PC Growth	[3] State + Local Exp. PC Growth	[4] State + Local Exp. PC Growth
TEL Index	-0.148	-0.274*	-0.254**	-0.318**
	-0.12	-0.151	-0.111	-0.14
Per Capita Income (000s)		-0.02		0.055
		-0.041		-0.034
TEL Index X Per Capita Income (000s)		0.006		0.003
		-0.004		-0.003
Num.Obs.	2,400	2,400	2,400	2,400
R2 Adj.	0.41	0.41	0.62	0.62
R2 Within	0	0	0	0

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

Sources: Calculations using data from the Census Bureau, Bureau of Economic Analysis, and Mitchell.

## TEST 2: DIFFERENT TEL TYPES AND STRINGENCY AS MEASURED BY STATE AND LOCAL SHARE OF EXPENDITURES

Following the methodology outlined in Mitchell, Table 3 shows regression results that break down TELs into different categories based on the formula they employ to restrict budgets. To test whether particular TEL formulas have a differential effect on government spending, each regression contains a dummy variable for each TEL type, measured in four categories according to Mitchell. The first set of regressions in columns 1 and 2 test the correlation between state spending and various TEL formulas. In each specification, none of the TEL dummy variables achieve statistical significance—both in the simple dummy variable model and after interacting the TEL dummies with per capita income.

**TABLE 3. TEL CHARACTERISTICS AND STATE AND LOCAL EXPENDITURE SHARES, TWO-WAY FIXED EFFECTS ESTIMATIONS**

Table reports two-way fixed effects regression results for the impact of TEL adoption on state and local government expenditure shares of state personal income. Odd-numbered columns report simple differences in differences estimations. Even-numbered columns replicate the baseline specifications in Mitchell without control variables by interacting the TEL dummy with per capita personal income. Columns 1 and 2 estimate a TEL adoption's effect on each specification and includes state and year fixed effects. Robust standard errors are clustered at the state level and shown in parentheses.

	[1] State Share	[2] State Share	[3] State + Local Share	[4] State + Local Share
TEL: Inflation + Population	0.430 (0.688)	0.413 (0.721)	0.763 (1.052)	0.727 (1.123)
TEL: Income Growth Basis	-0.071 (0.199)	-0.099 (0.263)	-0.156 (0.245)	-0.168 (0.326)
TEL: Income Share Basis	0.209 (0.280)	-0.005 (0.211)	0.605* (0.325)	0.382 (0.406)
TEL: Other Basis	0.511 (0.326)	0.483 (0.334)	0.763* (0.430)	0.715* (0.385)
Per Capita Income (000s)		-0.101*** (0.032)		-0.167*** (0.037)
TEL: Income Growth Basis X Per Capita Income (000s)		0.005 (0.013)		0.006 (0.017)
TEL: Income Share Basis X Per Capita Income (000s)		-0.002 (0.016)		-0.009 (0.024)
Num.Obs.	2,450	2,450	2,450	2,450
R2	0.92	0.93	0.87	0.87
R2 Adj.	0.01	0.07	0.02	0.08

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

Sources: Calculations using data from the Census Bureau, Bureau of Economic Analysis, and Mitchell.

Adding in expenditures by local governments, the regressions show positive association between TELs adopted with income share or other basis formulas, although the estimates are only significant at the 10% level, which is not considered relevant. These estimates are small in magnitude as well. The regression estimates in column 3 only show that TELs based on other formulas and income-share-based TELs are associated with only around 0.8% and 0.6% higher state and local revenue shares compared to non-TEL states, respectively. Adding per capita income into the model in column 4 yields a similar coefficient on the dummy for TELs that limit government spending through other bases of around 0.7%. Again, this coefficient estimate is only significant at the 10% level.

In addition to these TEL characteristics, other studies in the literature test whether more stringent TELs have a greater effect on government expenditures. Given a wide variation in TEL laws' stringency across states, studies often consider all potential binding TEL constraints equally.

Following the approach in Mitchell, this test involves creating a TEL stringency index based on the aforementioned TEL characteristics. This index is computed from the following factors: adopted by referendum or constitutional convention, adopted by initiative, constitutional, applies to spending (as opposed to revenue), requires a supermajority for override, automatically refunds surpluses, and prohibits unfunded mandates. The index itself ranges from 0 to 6.

Table 4 shows the fixed effects estimates for the association between TEL stringency and governmental expenditures. Similar to Mitchell, the estimates in column 3 show that a unit increase in the TEL stringency index is associated with a small percent increase in state government spending as a share of income. These estimates are relatively small in magnitude and range from 0.04% in the TEL dummy model to 0.08% after controlling for income. Both coefficient estimates are statistically insignificant. Considering the sum of both state and local government spending, the estimates still show a positive and insignificant association between the TEL stringency index and spending. Taken together, these estimates show no significant association between more stringent TEL laws and changes in government spending as a share of states' income.



**TABLE 4. TEL ADOPTION INDEX AND STATE AND LOCAL EXPENDITURE SHARES, TWO-WAY FIXED EFFECTS ESTIMATIONS**

Table reports two-way fixed effects regression results for the impact of the TEL index described in Mitchell on state and local government expenditure shares of state personal income. Columns 1 and 3 report simple differences in differences estimations. Columns 2 and 4 replicate the baseline specifications in Mitchell without control variables. Each specification includes state and year fixed effects. Robust standard errors are clustered at the state level and shown in parentheses.

	[1] State Share	[2] State Share	[3] State + Local Share	[4] State + Local Share
TEL Index	0.038 (0.080)	0.079 (0.116)	0.119 (0.120)	0.247 (0.213)
Per Capita Income (000s)		-0.096*** (0.028)		-0.159*** (0.033)
TEL Index X Per Capita Income (000s)		-0.002 (0.003)		-0.007 (0.006)
Num.Obs.	2,450	2,450	2,450	2,450
R2 Adj.	0.92	0.92	0.86	0.87
R2 Within	0.00	0.06	0.01	0.08

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

Sources: Calculations using data from the Census Bureau, Bureau of Economic Analysis, and Mitchell.



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