Using a Debt Brake to Solve Colorado's Debt Crisis

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Abstract

In recent years debt in Colorado has increased at an unsustainable rate. In this study, a Swiss style 'debt brake is simulated for the Colorado economy. A spending cap is imposed on the rate of growth in state spending. Some surplus revenue above the spending cap is earmarked for debt reduction. Dynamic simulation analysis reveals that with the debt brake in place, debt in Colorado could be reduced to a sustainable level.

Introduction

We propose a debt brake to solve Colorado's debt crisis. To understand the rationale for this proposed fiscal rule we begin by exploring Colorado's debt rules and debt in an historical perspective. The concept of sustainable debt is then explored. A debt brake is a recent innovation in fiscal rules that has proven to be successful in other countries in reducing debt to sustainable levels. A debt brake to achieve sustainable debt in Colorado is introduced and dynamic simulation analysis is used to estimate the impact of the proposed debt brake on the state budget and economy.

We also explore the potential for complementarity between the proposed debt brake and procedural constraints imposed by the Taxpayer Bill of Rights (TABOR) Amendment. The study concludes with a discussion of the implications of this analysis for addressing the debt crisis in other states and at the national level.

Colorado's Debt Crisis in Historical Perspective

Colorado's original Constitution incorporated provisions requiring a balanced budget, and very stringent limits on the power of the state to issue debt. In 1992 Colorado citizens enacted the Taxpayer Bill of Rights (TABOR) Amendment. It requires voter approval for any jurisdiction to issue new debt. With these stringent constitutional constraints on debt we would expect the state to limit the amount of debt issued, and certainly not to encounter a debt crisis (State of Colorado 2019a, 2019b; Poulson 2004a, 2004b).

Over the first century of Colorado's history the state was in fact bound by the stringent constitutional limits on debt. However, over the past half century state debt has increased significantly, and in recent years the state has accumulated debt at an unsustainable rate. The explanation for this debt crisis in Colorado is that the constitutional constraints apply only to 'full faith and credit' debt. The state circumvents these constitutional debt limits by incurring 'off-budget' liabilities (Merrifield 1994).

"Off-budget' liabilities are incurred in different debt instruments. The state has created special authorities that administer specific projects, and issue debt to finance them. By setting up public corporations, lease purchase agreements, and delegating state functions to political subsidiaries the state issues 'non-guaranteed' debt, which is not restricted by constitutional limits. In recent

years the most rapid increase in this 'non-guaranteed' debt is in the form of unfunded liabilities in state pension and other state benefit plans. The plausible and most realistic assumption is that the state will not allow 'off-budget' entities to go bankrupt in the case of illiquidity, such 'non-guaranteed' debt ultimately constitutes a liability to Colorado taxpayers, similar to 'full faith and credit' debt. Off-budget' activities and 'non-guaranteed' debt is increasingly used to circumvent the constitutional debt limits. Reliance on 'non-guaranteed' debt accelerated after the TABOR Amendment was enacted in 1992, because this 'off-budget' debt does not require voter approval. By exploring trends in Colorado's state debt in recent decades we gain insight into the sources of the debt crisis, and potential solutions to the crisis (Colorado Department of Treasury 2019).

General Obligation Bonds

The Colorado Constitution prohibits the state from borrowing money with a promise to pay. However, local governments, such as school districts, can issue general obligation bonds with voter approval.

Tax or Revenue Anticipation notes

Tax or revenue anticipation notes are issued by a government with the pledge that they will be repaid over time from a specific revenue source. The state issues tax revenue anticipation notes to meet annual cash flow needs. These notes are repaid in the same fiscal year. The constitution prohibits multiyear debt without voter approval. Over the past two decades, voters in Colorado approved revenue anticipation notes for the construction of highway projects.

Certificates of Participation (COPs)

Certificates of participation (COPs) are lease financing agreements. The state enters an agreement to make lease payments for the use of an asset over time, after which the title of the asset transfers to the government. Since the state can decide at any time, to discontinue the lease, COPs are not considered multiyear fiscal obligations and can be issued without voter approval. Over the past two decades the state has issued COPs for the construction of buildings in higher education, the health science center, the justice system, and museums.

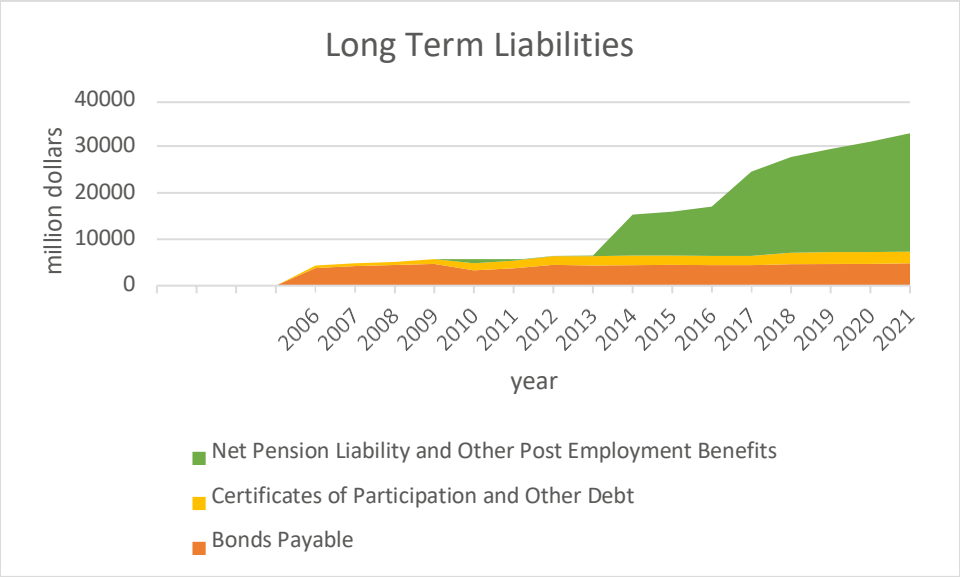
Other Long Term Liabilities

Other long term liabilities are incurred when the state, or agencies of the government use debt to fund obligations other than capital construction. For example, College Invest issues debt to finance student loans.

Unfunded Liabilities in Pension and Health Care Plans

Unfunded liabilities are incurred when the state owes money for employee benefits that are accumulating but not yet due. These obligations are incurred in the state pension plan for public employees (PERA), and for health benefits in Other Post Employee Benefit (OPEB) plans. In the last decade the Government Accounting Standards Board (GASB) issued guidelines for states to report these unfunded liabilities in the Comprehensive Annual Financial Report (CAFR).

Recent Trends in Colorado Debt



Source: The data for 2006-2018 is from the Colorado Comprehensive Annual Financial Reports (CAFRs). The data for the forecast period 2019-2021 is projected debt based on economic forecasts by the Colorado Legislative Staff.

The above graph charts the trend in Colorado state debt in both government and business activities. It is clear that constitutional limits have been effective in constraining general obligation debt. Bonds payable to the state have increased about 20% over this period. The growth in this form of debt, which requires voter approval, has been less than the growth in personal income and state revenue over the period.

It is also clear that the state has been successful in circumventing these constitutional limits by issuing Certificates of Participation (COPs) and Other debt. These forms of debt increased fivefold over the period, much more rapidly than the growth in personal income and state revenue. State and state related enterprises relied on these forms of debt because they are not subject to the constitutional restrictions on general obligation bonds. When some local jurisdictions failed to gain voter approval to issue general obligation bonds, they issued COPs to fund the same projects without voter approval.

The state began reporting unfunded liabilities in the state OPEB plan in the 2011 CAFR, and in the state pension plan (PERA) in the 2014 PERA CAFR (State of Colorado 2018; Public Employees' Retirement Association 2018b). The annual CAFR data does not capture the discontinuous increase in unfunded liabilities in PERA that occurred during the financial crisis. During the financial crisis the market value of assets in the PERA plan fell by almost half, and PERA has not really recovered since then. Unfunded liabilities in PERA have grown rapidly over the past decade, and now account for most state long term liabilities.[1]

[1] The estimated unfunded liabilities in PERA are based on assumptions in their actuarial studies. A number of studies question the discount rate used in these actuarial studies, see for example American Legislative Exchange Council (2018).

State debt in Colorado has grown rapidly over the past two decades, despite the limitations on debt imposed by the Constitution. This rapid growth in debt is not sustainable, and Colorado must enact new fiscal rules designed to more effectively constrain the growth in debt. In this study we propose a 'Debt Brake' for Colorado that can reduce debt to sustainable levels. 'Debt Brakes' have proven to be effective in reducing debt in other countries at both the state and local level. To understand the rationale for a 'Debt Brake' we begin with a discussion of debt solvency and sustainability.

Debt Solvency and Sustainability

Solvency simply means the ability to meet financial obligations in full and on time. When individuals and private firms become insolvent they may face legal sanctions or be forced into bankruptcy. Governments can also become insolvent when they fail to meet their financial obligations (Rules for Sustainable Fiscal Policy 2019).

We can dismiss a proposition in modern monetary theory that sovereign governments are immune from insolvency (Wray 2015). That proposition states that sovereign governments can incur deficits and accumulate debt of any size. Sometimes referred to as the 'Golden Rule of Solvency', the proposition assumes that sovereign governments can meet their debt obligations by simply printing more money. The states cannot issue their own currency, but the assumption in modern monetary theory is that the federal government can print money to bail out the states and avoid insolvency. We have seen the outcome when sovereign governments print money without constraint, in the hyperinflations experienced in Germany following World War One, and more recently in Venezuela.[2]

An alternative view of solvency is based on a mathematical proposition. If the rate of economic growth exceeds the rate of interest, debt can grow without limit. In the U.S. total debt now exceeds gross domestic product (GDP), and Keynesians argue that even if total debt grows to some multiple of GDP this is not a problem as long as economic growth exceeds the rate of interest. The flaw in this Keynesian view is that higher levels of debt impact both the rate of economic growth, and the rate of interest. Indeed, the Congressional Budget Office projects that as the ratio of debt to GDP continues to increase in the long term this will be accompanied by higher interest rates, and retardation in the rate of economic growth. The CBO also points out that printing more money that leads to hyperinflation is not a solution to our debt crisis.

An alternative approach to solvency is suggested by the literature on what is referred to as the market discipline hypothesis.[3] An important proposition in this approach is a nonlinear relationship between yields and debt levels. Yields may not rise smoothly with increases in the

[2] During the recent financial crisis the federal government bailed out the states by subsidizing their bond issues, and through direct transfers. However, it is not clear that the federal government now has the fiscal space to bail out the states (Merrifield and Poulson 2017a).

[3] For example. Jaffee and Russell (1976); Stiglitz and Weiss (1981); Easton and Gersovitz (1981); Bishop et al. (1989); Bayoumi et al. (1995).

debt levels. Yields may rise gradually at first, but eventually yields increase in a steep nonlinear way, and at some point credit markets respond by denying borrowers credit.

If the relationship between yield and debt levels is nonlinear, it is possible to estimate the level of debt at which a state defaults. The literature on interest rates and state bonds indicates that the probability of default is also affected by cyclical factors, and constitutional constraints on borrowing (Liu and Thakor 1984).

Bayoumi et al. (1995), for example, find strong evidence for a nonlinear relationship between yields and debt for U.S. states, consistent with the market discipline hypothesis. They find that the yield on state debt increases by 23 basis points per percentage point increase in debt levels, but, at debt levels one standard deviation above the mean, the increase in yields rises to more than 35 basis points. They estimate that credit is rationed at debt levels about 25 basis points above the highest debt levels in their sample of states. The supply of credit to U.S. states is steep because of rising default premia. In their preferred equation the maximum debt level at which credit is constrained is 8-9 percent of gross state product.

It is important to note that Bayoumi et al. find that constitutional rules to constrain debt significantly reduce the cost of borrowing in the states. They estimate a 50 basis point decrease in the cost of credit in states with effective constitutions debt limits.

A Pragmatic Approach to Debt Solvency and Sustainability: Red States, Blue State, and Zombie States

If states cannot depend upon federal bailouts to avoid insolvency, they must rely upon their own financial resources. This suggests a more pragmatic approach to the issue of debt solvency and sustainability. The ability of a state to meet its financial obligations will depend upon its own resources as measured by personal income. We can define a debt tolerance level as a ratio of debt to personal income above which the state begins to incur the risk of default. Since the state is vulnerable to financial crisis and recessions with revenue shortfalls, the ratio of debt to personal income must be held below this tolerance level.

Based on Bayouni et al. we use as a debt tolerance level a ratio of debt to personal income equal to 10%. For most states this is a level of debt that exceeds state revenue. Since states are vulnerable to financial crisis and recession, accompanied by revenue shortfalls, debt should be held below this debt tolerance level. States that pursue prudent fiscal policies maintain their debt/personal income ratio well below the 10% debt tolerance level. States that pursue imprudent fiscal policies allow the debt/personal income ratio to exceed the 10% debt tolerance level. A survey of state debt reveals that states can be classified into three categories, red states, blue states, and Zombie states

Red states are states that have pursued prudent fiscal policies, maintaining debt/personal income ratios well below the 10% debt tolerance level. Red states are states that have not experienced debt fatigue. Debt fatigue occurs when a state allows the debt/personal income ratio to increase in excess of the 10% debt tolerance level. Some red states experienced a sharp increase in the debt/personal income ratio during the financial crisis in 2008, and the coronavirus pandemic. But these states did not experience debt fatigue; they responded to these economic shocks with more prudent fiscal policies designed to reduce the debt/personal income ratio well below the 10% debt tolerance level.

Blue states are states that have experienced debt fatigue. As the debt/personal income ratio in these states

increased to, or in excess of, the 10% tolerance level, they continued to pursue imprudent fiscal policies resulting in unsustainable levels of debt.

A special category of blue states is referred to as Zombie states. Zombie states have pursued imprudent fiscal policies that resulted in debt/personal income ratios well above the 10% debt tolerance level for many years.

While these states have not defaulted on their debt, they have been credit constrained. To issue debt they must pay higher interest cost, which of course contributes to debt unsustainability. The impact of recent economic shocks in some Zombie states did in fact close their access to credit markets. But, federal bailouts, including subsidies and guarantees of state bond issues, rescued the Zombie states from default. Federal bailouts shifted the risk of their debt issue to taxpayers.

States experiencing debt fatigue lose their tolerance for debt. After accumulating debt at an unsustainable rate for years, elected officials become dependent on debt. But unsustainable debt levels have a negative impact on a state's fiscal health, even though the state may not default on debt. More state revenue most be earmarked for debt service, leaving less revenue for productive expenditures. In areas such as education more revenue must be earmarked for unfunded liabilities in pension and OPEB plans, leaving less revenue for classroom instruction and school construction. Debt fatigue has a negative impact on all citizens, including interest groups that benefit from more government spending. Teachers, firefighters, and policeman are finding that debt fatigue is a threat to their jobs and livelihood, and are beginning to challenge imprudent fiscal policies that result in unsustainable debt.

Debt fatigue means that a state is less able to respond to economic shocks such as the financial crisis in 2008, and the coronavirus pandemic. The state is increasingly dependent on federal bailouts to fund even basic services such as education K-12.

Designing a 'Debt Brake' to Solve the State Debt Crisis

Solving the state debt crisis requires that fiscal rules and fiscal policies are designed to achieve the desired debt level. The 'debt brake' proposed in this study follows the precedent set in other countries that have successfully enacted debt brakes to reduce debt to sustainable levels in the long run (Merrifield and Poulson 2016a, 2016b, 2017a, 2017b). The most successful of these is the Swiss 'debt brake' used to reduce debt levels at both the national and cantonal level. The Swiss 'debt brake' has been used as a model for new fiscal rules adopted by the European Union and by other OECD Countries. The 'debt brake' that we propose is modeled after the Swiss 'debt brake', however, there are key differences in the 'debt brake' that we propose (Merrifield and Poulson 2016a). This pragmatic approach to solvency requires that the fiscal rules have support from a broad cross section of citizens. Debt brakes have been effective in achieving debt sustainability in countries such as Switzerland, Sweden, and Norway because they commanded support across political parties and coalitions.

Application of the debt brake assumes a cap on the rate of growth in state expenditures. The debt brake is designed to give policy makers options in setting the cap on the rate of growth state expenditures. Our

research reveals that a cap equal to the rate of inflation plus the rate of growth in population is more stringent than other caps on spending that the states have used.

Flexibility is introduced in imposing a cap on the growth in state spending by introducing a spending cap multiplier. With a multiplier of 1 the cap is equal to the sum of inflation plus the rate of population growth. With a multiplier greater than 1 the cap is set higher than the rate of inflation plus the rate of population growth. In this study we explore the impact of a spending cap multiplier equal to 1.2, as well as 1.

The debt brake is linked to the cap on spending growth. When the ratio of debt to personal income approaches the debt tolerance level the debt brake is triggered. A debt threshold is defined as the level of debt that triggers the debt brake. We have chosen a debt threshold equal to 80% of the debt tolerance level; when the ratio of debt to personal income exceeds 80% of the debt tolerance level this triggers the debt brake. When the debt brake is triggered the spending cap is reduced. The surplus revenue is then earmarked for debt reduction. The debt brake remains in place as long as the debt/personal income ratio exceeds the debt threshold.

The debt brake is complemented by other fiscal rules. An emergency fund provides for increased spending in response to natural disasters, such as the coronavirus pandemic. A budget stabilization fund sets revenue aside to offset revenue shortfalls during periods of recession, such as the financial crisis. A capital investment fund is introduced to prioritize infrastructure investments. Flexibility is introduced by allowing policy makers to adjust the caps on each of these funds.

When state spending is constrained by the spending cap, surplus revenue above the spending cap is allocated to the emergency fund, the budget stabilization fund, and the capital fund. When the cap on each of these funds is reached any additional surplus revenue is allocated equally between debt relief and taxpayer relief. Debt relief is achieved by reducing debt levels. Taxpayer relief is achieved by taxpayer rebates and/or tax rate cuts. Details of the simulation model are provided in the Appendix. More detailed information for the parameter values used in the simulation model are available upon request from the authors.

The debt brake should be designed to reflect the unique debt experience and fiscal institutions in each state. Historically the goal in some red states was to eliminate debt entirely. Today that is more likely to be perceived as an aspirational goal, rather than the basis for fiscal rules or fiscal policies. A more pragmatic approach in these red states is to set a debt tolerance level well below the ratio of debt to personal income that exposes the state to risk of default. Based on the recent trends of debt in some red states we explore the impact of fiscal rules with a debt tolerance level of 6%, as well as 10%.

For blue states the debt brake is designed to reduce and maintain the debt/personal income ratio below the 10% debt tolerance level. For most blue states the debt brake can achieve this sustainable debt level within several years. But for Zombie states that have experience debt fatigue for many years, achieving a sustainable debt level may take several decades.

Designing a debt Brake for Colorado

Over the past two decades Colorado's fiscal policies shifted dramatically from that of a red state to that of a blue state. In the 20th century Colorado was considered a conservative state pursuing prudent fiscal policies. The fiscal rules in place were effective in constraining the growth in state spending. While an increasing share of debt was shifted off budget, debt was well below the debt tolerance levels that would have exposed the state to

the risk of default. Over the past two decades, however, fiscal rules have proven to be less effective constraints on the growth in state spending. The financial crisis in 2009, and the coronavirus pandemic, were accompanied by a sharp increase in debt. But, the growth in debt in Colorado is a structural as well as cyclical problem. Over the past two decades the state has experienced debt fatigue. Much of the increase in debt in these years is unfunded liabilities in state pension and OPEB plans. Debt has increased more rapidly than personal income, and in recent years the state has been exposed to the risk of default on its debt.

The challenge in Colorado is to reduce debt to sustainable levels. A dynamic simulation model is used to estimate the impact of the debt brake on the state budget and economy in Colorado. The simulation model is estimated with actual data for the period 2007-2019, and with forecast data for the period 2020-2021. Data for personal income, population, and fiscal data is from the annual Colorado Legislative Staff 'Economic and Revenue Forecast'. Data for debt is from the Colorado Comprehensive Annual Financial Report (CAFR). Total Colorado debt includes bonds payable, certificates of participation (COPs), other debt, unfunded liabilities in the state pension plan (PERA), and Other Post-employment Benefits (OPEB).

We assume a stringent cap on the rate of growth in state spending in Colorado for several reasons. Colorado revenue is very volatile, because the state relies heavily on income tax revenue. The state has become more diversified, but is still impacted by volatility in prices for oil and natural gas. In the dynamic simulation analysis three different fiscal rule designs are compared:

Case 1. Basic Rule

The basic rule design sets the debt tolerance level at 10%. The debt threshold that triggers the debt brake is 8%. The cap on the rate of growth in state spending is set equal to the rate of inflation plus the rate of growth in population. The expenditure rule multiplier is set equal to 1.

Case 2. Lower Debt Tolerance Level

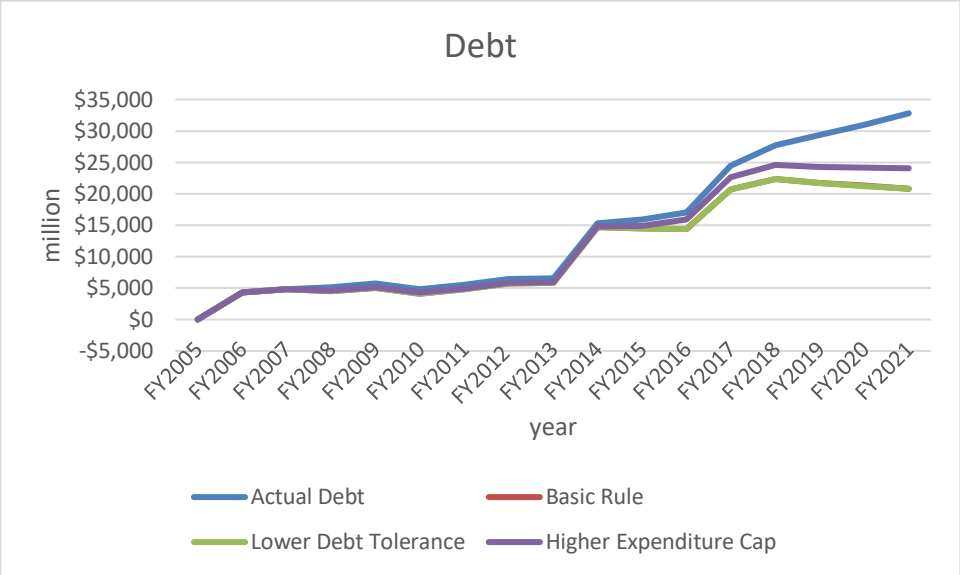
A more prudent approach in fiscal rule design sets a lower debt tolerance level. In case 2 the debt tolerance level is set at 6%. The debt threshold that triggers the debt brake in this case is 4.8%. The cap on the rate of growth in state spending is set equal to the rate of inflation plus the rate of growth in population. The expenditure rule multiplier is set equal to 1.

Case 3. Increased Expenditures Multiplier

In case 3 the debt tolerance level is set at 10%, and the debt threshold that triggers the debt brake is 8%. A higher expenditures cap multiplier allows state spending to increase more rapidly than inflation plus the rate of growth in population. The expenditures cap multiplier is set at 1.2 times the rate of inflation plus the rate of growth in population.

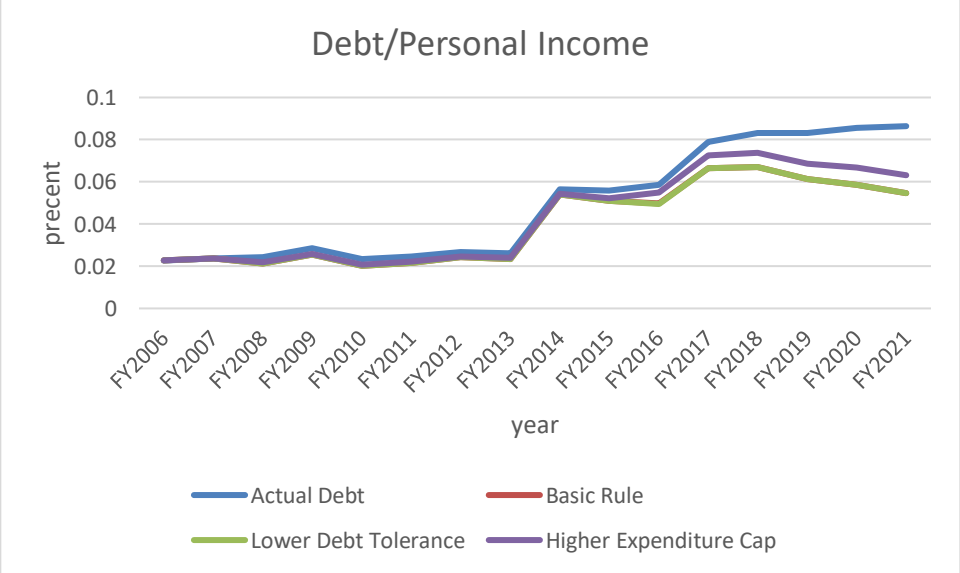
State Debt

The following graph compares actual debt with debt simulated for fiscal rules in each of the three cases.



Actual debt increases over the period from $4 billion to $33 billion. Simulated debt increases at a slower rate with fiscal rules in each of the three cases. With the basic fiscal rules debt increases to $20 billion. With the lower debt tolerance level debt increases to a slightly lower level. With the higher expenditures cap multiplier, debt increases to a significantly higher level compared to the other fiscal rules, $24 billion.

The most important measure of debt sustainability is the debt/personal income ratio. The following graph compares the actual debt/personal income ratio with the simulated ratio with fiscal rules in each of the three cases. The actual debt/personal income ratio increases from 2.3% to 8.6% over the period.



With the basic rule in place simulated debt increases to 6.7% in 2018, and then falls to 5.5% in 2021. Because the simulated debt/personal income ratio is held below the 8% debt threshold, the debt brake is not triggered.

With the lower 6% debt tolerance level, the debt/personal income ratio increases at a slightly lower rate than with the higher debt tolerance level. However, the simulated debt/personal income ratio exceeds this debt threshold in 2016, triggering the debt brake for the remainder of the period. The lower tolerance level is a more stringent constraint on the growth in debt, compared to the other fiscal rules.

With the higher expenditures cap multiplier the simulated debt/personal income ratio increases to 7.2% in 2017, and then falls to 6.3% by the end of the period. Because the simulated debt/personal income ratio is held below the 8% debt threshold, the debt brake is not triggered. The higher expenditures cap multiplier is a less stringent constraint on the growth in debt.

The simulation analysis reveals that with these fiscal rules in place over the last two decades, Colorado could have maintained a debt/personal income ratio below the 10% debt tolerance level. Enacting the fiscal rules to achieve a sustainable debt level today is a more difficult challenge. It would take several years to reduce the debt/personal income ratio below the 8% debt threshold.

The 10% debt tolerance level is a low bar to achieve for a state with a long history of conservative fiscal policies. Setting a 6% debt tolerance level is more consistent with that historical tradition. Using the fiscal rules to reduce the debt/personal income ratio below a 6% debt tolerance level would likely take several decades. The simulation analysis reveals how dramatic the shift from a red state to a blue state has been in Colorado.

State Spending

State Spending

The following graph compares actual general fund spending with simulated spending with the proposed fiscal rules in place. Actual spending grows from about $6 billion to $14 billion. With the fiscal rules in place the growth in state spending is significantly reduced.[5]

[5] The divergence between actual spending and revised spending reflects both the TABOR spending limit, and the proposed fiscal rules. In 2005 Referendum C suspended the TABOR limit for five years (Merrifield and Poulson 2014)

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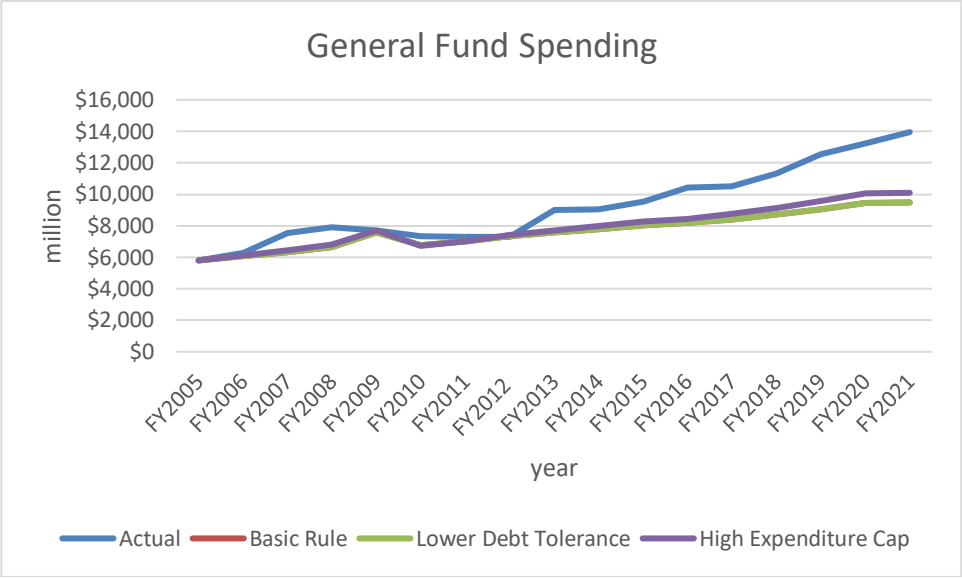
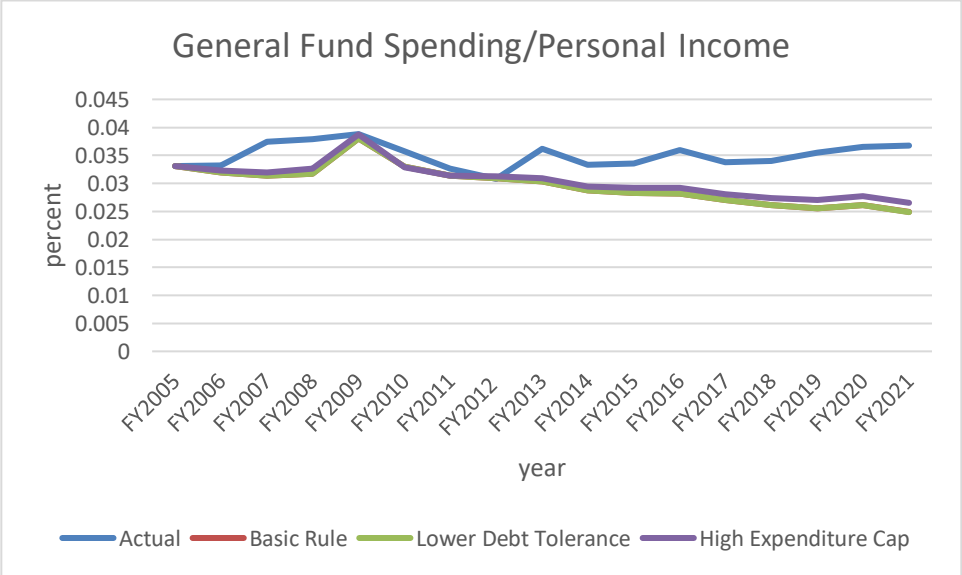


In case 1, with the basic fiscal rules, general fund spending increases to about $9 billion. With the lower debt tolerance level in case 2, the growth in state spending is only slightly less.

In case 3, with a higher expenditures cap multiplier, general fund spending grows to about $10 billion.

The following graph compares the actual general fund sending/personal income ratio with the simulated general fund spending/personal income ratio with the proposed fiscal rules in place.



The actual general fund spending/personal income ratio increases from 3.3% to 3.7% over the period.

In case 1 with the basic rule, the general fund spending/personal income ratio decreases from 3.3% to 2.5%. In case 2 with a lower debt tolerance level, the ratio decreases at a slightly higher rate.

In case 3, with the higher expenditures cap multiplier, the general fund spending/personal income ratio falls to 2.7%.

It is clear that solving the debt crisis in Colorado will require a significant reduction in the rate of growth in state spending, and considerable downsizing of the state government relative to the private sector. This should not be surprising after two decades of debt fatigue. Enacting fiscal rules today to achieve a sustainable debt level will be a difficult task. Even with the proposed fiscal rules in place it will take several years to reduce debt in Colorado below the debt threshold that exposes the state to risk of default. Restoring the prudent fiscal policies that Colorado pursued historically as a red state will take decades.

Supply Side Effects of the Debt Brake

The dynamic simulation model captures modest supply side effects of the debt brake. With the proposed fiscal rules in place the growth in simulated personal income is higher than the growth in actual personal income. The dynamic simulation model assumes an opportunity cost of 6% when resources are shifted from the private sector to the public sector. The fiscal rules reduce the growth in state spending, providing a modest boost to economic growth. By the end of the period simulated personal income with the fiscal rules in place exceeds actual personal income by .2% to .3%. The modest increase in personal income is accompanied by a comparable boost in state revenue.

The 'Debt Brake' and TABOR

Colorado would be an excellent state to enact the fiscal rules proposed in this study. Colorado now has almost two decades of experience with a tax and expenditure limit, Taxpayer Bill of Rights (TABOR) (Merrifield and Poulson 2014, 2016c). However, it is important to emphasize the difference between the proposed fiscal rules and TABOR. TABOR has been modified many times over the past two decades, and these modifications have weakened the effectiveness of TABOR as a constraint on state spending. The proposed fiscal rules are more stringent than TABOR in its present form.

While the proposed fiscal rules would replace the substantive provisions of TABOR, the procedural TABOR rules could be retained. Currently TABOR imposes a procedural constraint on certain forms of full faith and credit debt, i.e. bonds and revenue anticipation notes. To issue this debt the state must have voter approval. To be effective, the proposed fiscal rules would require these procedural constraints on other forms of debt as well, i.e. certificates of participation, other debt, and new bonds issued to reduce unfunded liabilities in PERA and OPEB benefit plans. This should be straightforward when the state issues new debt to fund these programs.

> However, a number of factors could cause an increase in unfunded liabilities in PERA and OPEB plans. Much of the unfunded liability in these plans can be traced to imprudent decisions by the legislature to improve pension and health benefits offered to public employees, without providing for contributions to cover those benefits. As we have noted, a major factor in the rapid growth in unfunded liabilities was the sharp fall in the value of assets in PERA during the financial crisis and coronavirus pandemic.

There is of course no way to predict the impact of economic shocks on unfunded liabilities in these plans. However, the proposed fiscal rules would result in greater transparency and accountability for unfunded liabilities in PERA and OPEB plans. They would make explicit the reduction in spending when a greater share of revenue must be earmarked to reduce unfunded liabilities as well as other forms of debt.[6] Further, the proposed fiscal rules would create a disincentive for legislators to promise public employees benefits without the contributions

required to pay for those benefits. In short, with the proposed fiscal rules legislators would be less able to shift the tax burden of unfunded liabilities to future generations.

Under current TABOR law legislators can ask for citizen approval to spend surplus revenue that is earmarked for taxpayer rebates. These ballot measures require that legislators estimate both the magnitude of surplus revenue that taxpayers must forgo, and the magnitude of spending on different government programs.

With the proposed fiscal rules in place legislators could continue to ask for citizen approval to spend surplus revenue that is earmarked for taxpayer rebates. They could also ask for citizen approval to spend surplus revenue that is earmarked for debt reduction. In that case they would have to make the tradeoff between debt reduction and government expenditures even more explicit. They would have to estimate the amount of debt reduction that would not take place, and the magnitude of these funds that would be spent on different government programs.

It is important to emphasize that the proposed fiscal rules do not change the tradeoff between debt reduction and government spending, they simply makes it more explicit. They would expose 'hidden debt' in the form of unfunded liabilities in pension and health plans for public employees. Instead of shifting this 'hidden debt' to future generations, the debt brake shifts it to current generations.

We should expect that improved transparency and accountability for 'hidden debt' in the form of unfunded liabilities would generate taxpayer resistance. There is already taxpayer resistance to this tradeoff at the state and local level. As expenditures of pension and health benefits for public employees have absorbed greater shares of government budgets this has reduced the revenue available to provide more and better government services. Taxpayers are asking the obvious question, why are legislators promising benefits to public employees that they can't pay for.

Conclusion

The experience in Colorado reveals how debt fatigue can be hazardous to your health. Until the last two decades Colorado pursued prudent fiscal policies that maintained sustainable debt levels. But, over the past two decades elected officials in Colorado have allowed debt to grow at an unsustainable rate. Colorado has shifted rapidly from a red state to a blue state. Debt has been increasing more rapidly than personal income, and is projected to continue to do so in coming years. As the debt/personal income ratio continues to increase above the 8% debt brake threshold, Colorado is increasingly exposed to default in the state debt.

Debt fatigue in Colorado is having a negative impact on citizens. More state revenue must now be earmarked for debt service, leaving less revenue for productive expenditures. The state is less able to respond to economic shocks, and is increasingly dependent on federal bailouts during recessions to sustain even basic services.

Politicians have convinced citizens that we should stop worrying, and learn to live with our debt. But, Colorado citizens should not, like Wylie E. Coyote, continue to muddle along as we go off a

fiscal cliff. Colorado relies on very volatile income tax and energy tax revenues. Recessions, such as the financial crisis in 2008, and the current coronavirus pandemic, are accompanied by revenue shortfalls that require draconian cuts in state spending. The 'hidden debt' that the state is accumulating off budget, mostly in the form of unfunded liabilities in state pension and health benefits for public employees, becomes even more difficult to repay. The longer we defer paying these 'hidden debts' the more difficult it will be to solve the debt crisis.

Politicians sanguine attitude toward debt is reinforced by the most recent version of Keynesian economics, i.e. modern monetary theory. Colorado citizens should reject this excuse for accumulating debt at an unsustainable rate. These theories are nothing more than an excuse to print more money, which the Federal Reserve is more than willing to accommodate.

Other OECD countries, such as Switzerland, have enacted new fiscal rules to successfully address their debt crisis. The Swiss 'debt brake' has been adopted in other countries to reduce debt to a sustainable level at both the state and national level. The U.S. is now behind the learning curve in enacting effective fiscal rules, and each year that we continue along this path accumulating more debt, it becomes more difficult to solve the debt crisis. A 'debt brake' can be enacted to reduce debt to sustainable levels in the U.S., just as it has in these other countries.

In this study, a Swiss style 'debt brake is simulated for the Colorado economy. Colorado is a prime target for enacting such a 'debt brake' because of the experience with the TABOR Amendment. Enacted in 1992, the TABOR Amendment constrains the growth in state revenue and spending to the sum of inflation and the rate of growth in population. The proposed debt brake would replace the substantive provisions of the TABOR Amendment, but retain the procedural constraints imposed by TABOR. The 'debt brake' would apply to all debt including the 'hidden debt' that has increased sharply in recent years. The 'debt brake' would require citizen approval for all new debt, including 'hidden debt'.

Dynamic simulation analysis reveals that with the 'debt brake' in place debt in Colorado could be reduced to sustainable levels over two decades. Critics will argue that a 'debt brake' requires draconian cuts in state spending. In fact, a debt brake requires not a reduction in state spending, but rather a reduction in the rate of growth of state spending until the state restores a sustainable debt level. By incorporating a 'debt brake' in the constitution citizens would replace the discretionary fiscal policies pursued by our politicians with a rules based fiscal policy.[7]

The simulation analysis reveals that overcoming debt fatigue and addressing the debt crisis becomes more difficult each year. Colorado is a long way from the prudent fiscal policies pursued as a red state in the 20th century. After years of debt fatigue it will take years for Colorado to recover from the fiscal profligacy of the past two decades. There is no alternative to the fiscal austerity and government downsizing now required to solve the debt crisis.

A 'debt brake' enacted in Colorado, and other states with a history of fiscal discipline, could set an example for other states and for the federal government. This would follow the Swiss precedent where the 'debt brake' was first enacted at the cantonal level. Interstate competition then forces more profligate states to enact these stringent fiscal rules. With a track record of

Fiscal discipline at the cantonal level, Swiss citizens were successful in enacting a 'debt brake' to impose fiscal discipline on their national government. To be successful in the U.S., a debt brake must have this broad citizen support across political parties and interest groups.

[6] For a discussion of fiscal illusion see Buchannon and Wagner (1977). For a broader discussion of the benefits of rules based versus discretionary fiscal policy see Buchanan and Brennan (1985); and Taylor (1993).

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Appendix: Variable Definitions, Parameters, and Equations for the State Calculator

Numbers shown are default values

$EMERG_0 = 0.2 \times SP_0$; Average Annual Certifiable Emergency Cost to the State

EFCAPRT = 0.2; Emergency Fund Account Balance Cap as a share of State Spending (SP).

CCRT = 0.5; countercyclical spending rate increase, as a share of Revenue (REV).

BSFCAPRT = 0.1; Budget Stabilization Fund Account Balance Cap as a share of State Spending (SP).

BSFSPRT = 0.7; limit on share of BSF spendable in one year.

$BSFEAR_t = 0$, revenue, in millions earmarked for BSF deposit.

KCAPRT = 0.05; Capital Improvement Fund Account Balance Cap as a share of State Spending (SP).

KSPRT = 0.7; limit on share of Capital Improvement Fund Account spendable in one year.

KSHSU

RP = 0.25; Capital Improvement Fund Share of remaining surplus.

CSLRT = 1.0; multiplier for Pop + Infl growth limit on Discretionary Spending Growth.

GRCHG = 1.0; growth rate adjustment parameter.

$RECESS_t = 0$; recession size in year t.

$EXOGTAXCH_t = 0$; exogenous tax rate change starting in year t.

OCR = 0.06; marginal opportunity cost rate for shifting resources from private to public use.

MTR = Average Tax Rate = REV_0/PI_0

RMTR = 0.00251

DEBTTOL = 0.1; limit on sustainable total state debt tolerance; share of PI

DEFTOL = 0.02; deficit-level intolerance; share of PI

TOLPROX = 0.8; deficit- or debt-based spending growth braking commences with RDEBT/RPI > (0.8)DEBTTOL or (0.8)DEFTOL

DEBTBRT = 1.0; debt-based braking rate; rate of debt-based reduction in CSLRT.

DEFBRT = 1.0; deficit-based braking rate; rate of deficit-based reduction in CSLRT.

TRCT = 0; equals '1' for a surplus-based Tax Rate Cut Trigger.

NCYC = 0.2 when TRCT = 1; the weighted drop in MTR for Tax1 that will result from the size of SURPLUS/SP when SURPLUS > 0.

EQUATIONS:

$API_t = (((PI_t - PI_{t-1})/PI_{t-1}) \times API_{t-1}) + API_{t-1}$ - Adjusted Personal Income

Users can choose replacement values for GRCHG and $RECESS_t$ default values.

$API_0 = PI_0$ Note: the zero subscript denotes the first data point, which is the last 'real' number. All other data are User-Supplied projections or computed values.t = 1 is the first calculated value

$RPI_0 = PI_0$ Revised Personal Income starts equal to actual personal income.

$RDEBT_{-1} = RDEBT_0 = DEBT_0$ Simulation revised debt.

$RDEFPI_{-1} = RDEFPI_0 = 0$ Debt as a share of personal income.

$EFINT_0 = 0$ Emergency Fund Interest Earned

$BSF_0 = 0$ Initial Budget Stabilization Fund Balance

$BSFINT_0 = 0$ Initial Budget Stabilization Fund Balance

$EF_0 = 0$ Initial Emergency Fund Balance

$RREV_0 = REV_0$ Simulation Revised Revenue

$RSP_0 = SP_0$ Simulation Revised Spending

$CCBUMP_0 = 0$ Initial Countercyclical Spending Bump

$AMTR1_0 = MTR1$ Initial Adjusted Marginal Tax Rate

$SURP118_0 = 0$ Initial Surplus after EF and BSF deposits

$SGBASE_0 = SP_0$ Initial 'Steady Growth' Base – no ratchet down

$BASE_0 = SP_0$ Initial Spending Growth Base – subject to ratchet

$RDEBTPI_0 = RDEBT_0/PI_0$ Initial Simulation Revised Debt to PI ratio.

$REVREST_t = REV_t - REV1_t - REV2_t$

$AMTR1_t = IF(TRCT = 0, MTR1, IF((RREV_{t-1} - RSP_{t-1}) > 0, (1- ((RREV_{t-1}/REV1_{t-1}) \times NCYC \times ((RREV_{t-1} - RSP_{t-1})/RREV_{t-1})) \times AMTR_{t-1})), AMTR1_{t-1}))$

$GA_t = (RMTR \times (EXOGTAXCH_t + (AMTR1_t - AMTR1_{t-1})) \times 100) + 1$ Economic Growth Rate Adjustment

$RPI_t = (RPI_{t-1} \times GA_t) + (API_t - API_{t-1}) + (OCR \times ((RREV_t - RSP_t) - EMERG_t))$ Simulation Revised PI

$MTR1 = REV1_0/PI_0$ Initial REV1 Tax (e.g. income tax) Marginal Tax Rate

$MTR2 = REV2_0/PI_0$ Initial REV2 Tax (e.g. income tax) Marginal Tax Rate

$MTRREST = (REV_0 - REV1_0 - REV2_0)/PI_0$

$STATSH_t = (EXOGTAXCH_t/MTR1) \times (REV1_t/REV_t)$ Static Revenue Share for REV1 Tax

$RREV_t = (REV_t \times (1 - STATSH_t)) + ((RPI_t - API_t) \times (AMTR1_t + MTR2 + MTRREST)) + EFINT_{t-1} + BSFINT_{t-1}$

$POPGR_t = ((POP_{t-2}/POP_{t-3}) - 1)$ Population Growth Rate

$RDEFPI_t = IF(RDEBT_{t-2} = 0, 0, IF((RDEBT_{t-1} - RDEBT_{t-2}) < 0, 0, (RDEBT_{t-1} - RDEBT_{t-2})/RPI_{t-1}))$

$RDEBTPI_t = RDEBT_{t-1}/RPI_{t-1}$

$DEBTBRK_t = IF(RDEBTPI_t < (TOLPROX * DEBTTOL), 1, IF(((RDEBTPI_{t-1}/DEBTTOL * (RDEBTPI_{t-1} - (TOLPROX * DEBTTOL))) * DEBTBRT > 1, 0, 1 - ((RDEBTPI_{t-1}/DEBTTOL) * (RDEBTPI_{t-1} - (TOLPROX * DEBTTOL))) * DEBTBRT))$

$DEFBRK_t = IF(RDEFPI_t < (TOLPROX * DEFTOL), 1, IF(((RDEFPI_{t-1}/DEFTOL * (RDEFPI_{t-1} - (TOLPROX * DEFTOL))) * DEFBRT > 1, 0, 1 - ((RDEFPI_{t-1}/DEFTOL) *(RDEFPI_{t-1} - (TOLPROX * DEFTOL))) * DEFBRT))$

$SGBASE_t = SGBASE_{t-1} \times ((1 + POPGR_t + INFL_t) \times CSLRT)$

$BASE_t = IF(SG = 1, SGBASE_{t-1} \times (((1 + POPGR_t + INFL_t) \times CSLRT) \times DEFBRK_t \times DEBTBRK_t), ((RSP_{t-1} - CCBUMP_{t-1}) \times (((1 + POPGR_t + INFL_t) \times CSLRT) \times DEFBRK_t \times DEBTBRK_t)))$

$CCBUMP_t = IF(RREV_t > RREV_{t-1}, 0, IF((STATSH_t \times 0.9) > STATSH_{t-1}, 0, IF((BSF_{t-1} \times BSFSPRT) - 0))))(BASE_t - RREV_t) > (CCRT \times (RREV_{t-1} - RREV_t)), (CCRT \times (RREV_{t-1} - RREV_t)), IF((BSF_{t-1} \times BSFSPRT) - (BASE_t - RREV_t) > 0, (BSF_{t-1} \times BSFSPRT) - (BASE_t - RREV_t),$

$RSP_t = IF(BASE_t + CCBUMP_t < RREV_t, BASE_t + CCBUMP_t, IF((BSF_{t-1} \times BSFSPRT) > (BASE_t + CCBUMP_t - RREV_t), BASE_t + CCBUMP_t, RREV_t + (BSF_{t-1} \times BSFSPRT)))$

$EXPSP_t = (((1 + POPGR_t + INFL_t) \times CSLRT) \times DEBTBRK_t) \times (RSP_t - CCBUMP_t)$ Expected Spending

$EFMAX_t = EFCAPRT \times EXPSP_t$ Maximum Emergency Fund Balance

$EFINT_t = EF_{t-1} \times STINT_t$

$EF2_t = IF((EF_{t-1} - EMERG_t) < EFMAX_t, EFMAX_t, EF_{t-1} - EMERG_t)$

$EF3_t = IF((RREV_t - RSP_t) > 0, RREV_t - RSP_t + EF_{t-1} - EMERG_t, EF_{t-1} - EMERG_t)$

$EF_t = IF((RREV_t - RSP_t) > (EFMAX_t - EF_{t-1} + EMERG_t), EF2_t, EF3_t) + EFINT_t$ Emergency Fund Balance

Calculated in three Stages; too many 'IF's for single, long 'EF =' equation.

$BSFDEB_t = IF(RSP_t > RREV_t, IF((BSF_{t-1} \times BSFSPRT) > (RSP_t - RREV_t), (RSP_t - RREV_t), (BSF_{t-1} \times BSFSPRT)), 0)$

$BSFMAX_t = BSFCAPRT \times EXPSP_t$

$BSFINT_t = BSF_{t-1} \times STINT_t$

$SURP117_t = IF(EF_t > EFMAX_{t-1}, IF((RREV_t - RSP_t) - (EF_t - (EF_{t-1} \times (1 + STINT_t)) > 0, (RREV_t - RSP_t) - (EF_t - (EF_{t-1} \times (1 + STINT_t)), 0), 0)$ Surplus remaining after EF deposit.

$BSF2_t = IF((BSF_{t-1} + SURP117_t - BSFDEB_t) > 0, (BSF_{t-1} + SURP117_t - BSFDEB_t), 0)$

$BSF3_t = IF((BSF_{t-1} + SURP117_t - BSFDEB_t) < BSFMAX_t, BSF2_t, BSFMAX_t)$

$BSF4_t = IF((BSF_{t-1} - BSFDEB_t) > 0, BSF_{t-1} - BSFDEB_t, 0)$

$BSF5_t = IF(BSF_{t-1} > BSFMAX_t, BSF4_t, BSF3_t)$

$BSF_t = IF(EF_t < EFMAX_t, BSF4_t, BSF5_t) + BSFINT_t + BSFEAR_t$ Budget Stabilization Fund Balance

Calculated in five Stages; too many 'IF's for single, long 'BSF =' equation.

$PICHTEN_t = ((PI_{t-2}/PI_{t-12})^{0.1}) - 1 - INFL_t$ Average growth rate for PI for last ten known years.

$PICHONE_t = (PI_{t-2}/PI_{t-3}) - 1 - INFL_t$ Average growth rate for PI for last known year.

$TENONEDIF_t = PICHTEN_t - PICHONE_t$

$TENVSONE_t = IF(TENONEDIF_t > 0, TENONEDIF_t, 0)$

$CCKSH_t = IF(TENVSONE_t = 0, 0, IF(TENVSONE_t > PICHTEN_t, KSPRT, (TENVSONE_t/PICHTEN_t) \times KSPRT))$ Capital fund spending in slow growth years.

$SURP118_t = IF(SURP117_t = 0, 0, IF((SURP117_t - (BSF_t - BSF_{t-1})) > 0, (SURP117_t - (BSF_t - BSF_{t-1})), 0))$

$KDEBCRED_t$ = IF($TENVSONE_t$ = 0, IF(KF_{t-1} < (KCAPRT x $EXPSP_t$), (($SURP118_t$ x KSHSURP) + (KF_{t-1}
x $STINT_t$)), 0), (((-1) x (($CCKSH_t$ x KF_{t-1}) – ((1- $CCKSH_t$) x KF_{t-1} x $STINT_t$)))))
Debit or deposit into Capital Fund.

$KF_t = KF_{t-1} + KDEBCRED_t$

$SGCAP_t$ = (($SGCAP_{t-1}$ – $CCBUMP_t$) x ((1 + $POPGR_t$ + $INFL_t$) x CSLRT)) + $CCBUMP_t$
Spending cap with no ratchet down allowed; growth based on previous cap.

$RDEBT_t$ = $RDEBT_{t-1}$ – IF($SURP118_t$ = 0, 0, IF($SURP118_t$ < $RDEBT_{t-1}$, $SURP118_t$, $RDEBT_{t-1}$))
+ ($DEBT_t$-$DEBT_{t-1}$) Simulation-revised debt.

REB_t = IF(($SURP118_t$ – $RDEBT_{t-1}$) > 0, ($SURP118_t$ – $RDEBT_{t-1}$), 0) Rebate Amount

$PIBUMP_t = RPI_t/PI_t$ Simulation-based PI change.

$SMALLER_t$ = (RSP_t/RPI_t)/(SP_t/PI_t) TEL-induced drop in spending share of PI.

$SGGAP_t = RSP_t/SGBASE_t$ Ratchet down amount.

$EPREP_t = EF_t/EFMAX_t$ Emergency Preparedness Rate.

$EFSIZE_t = EF_t/RPI_t$ EF size relative to PI.

$BSFPREP_t = BSF_t/BSFMAX_t$ Budget stabilization funds relative to max allowed.

$BSFSIZE_t = BSF_t/RPI_t$ BSF size relative to PI

$SPSH_t = RSP_t/RPI_t$ Spending size relative to PI

$REVSH_t = RREV_t/RPI_t$ Revenue size relative to PI