State Fiscal Policies for Budget Stabilization and Economic Growth: A Dynamic Scoring Analysis

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Economic downturns expose unsustainable fiscal practices. Widespread fiscal crises create opportunities to compare policy options that address especially adverse circumstances, especially pro-growth fiscal constraints that can stabilize state budgets over the business cycle. Our policy option assessments depart from the normal practice of assessing rules and policies independently. Our premise is that the fiscal policy mix determines its outcomes. We include dynamic scoring to provide a richer view of the policy interactions.

In this article, we assess reforms that address fiscal stress issues. We were driven, in part, by our conviction that stable spending growth over the business cycle curbs fiscal stress-induced pressures to raise taxes and weaken caps on spending growth. To generalize our findings as much as possible, we apply our dynamic scoring model to California, Montana, and Utah—states familiar to us that span the blue state–red state gamut, with Montana in the middle. Utah is "famously conservative" (Woo 2010), with one of the top business tax climates (Tax Foundation 2011). California's response to fiscal stress included large tax hikes, which helped create one of the worst business climates. With fiscal data and dynamic scoring, we simulate the economic growth and fiscal effects of income tax rate reductions and

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fiscal rules designed to constrain the growth in state spending and stabilize the budget over the business cycle.

The Fiscal Rollercoaster

In the five years that preceded the still lingering 2007–09 Great Recession, spending growth topped personal income growth in 37 states, including those with fiscal caps more extensive than the balanced budget rule, absent only in Vermont (Poterba 1994, Merrifield 2000). The expansion in those 37 states was enough to achieve a 50-state average spending growth rate 5 percent faster than personal income growth. Large budget deficits and fiscal crises arose when the Great Recession sharply cut revenues (Chapman 2009, Eaton 2009, Kalita 2009, Vock et al. 2009). Legislators could not sustain the good times' rapid spending growth achieved, in part, by overriding their statutory tax and expenditure limits (Stansel and Mitchell 2008).

A key reason for rapid state spending growth has been widespread use of personal income growth to define fiscal discipline (Shadbegian 1996, Waisanen 2010). An income growth-based cap is a convenient, politically comfortable limit when economic growth is normal, but uncomfortable when personal income growth is modest, and a crisis when growth is negative, as it has been recently (Schunk and Woodward 2005, Wagner and Elder 2005). Fiscal instability and uncertainty seem to accelerate spending growth (Holcombe and Sobel 1997). Fiscal crises can be primary agents of tax hikes that typically survive into future high-growth periods; a process that ratchets spending upward over successive iterations of the business cycle. Fiscal stress also spills over into off-budget spending (Bennett and DiLorenzo 1982, Merrifield 1994), and into on-budget funding substitutes such as regulation and more responsibility for local governments.

Tax and Expenditure Limits

Early studies of tax and expenditure limits (TELs) found evidence that they had only a small effect on state budgets.[1] But more recent studies provide evidence that TELs can effectively constrain the

[1]See Abrams and Dougan (1986), Bails (1990), Poterba (1994), and Poulson and Kaplan (1994).

growth in state spending[2] TELs that link spending growth to personal income are often nonbinding, and for binding TELs, the instability of personal income growth erodes support for TELs by creating periods of costly fiscal instability and uncertainty.[3] Economic conditions and the phase of the business cycle are key determinants of the effectiveness of TELs. For example, they seemed to be more binding in low-income states. Florida introduced a tax and expenditure limit in the recession phase of the business cycle that was never binding. The cap rose more rapidly than actual growth in state revenue.

In 1971, Ronald Reagan, then governor of California, along with Milton Friedman, campaigned for the first state TEL. Though voters narrowly rejected the attempt to cap California's state spending at 7 percent of state income, the Reagan-Friedman effort set the stage for the TELs later introduced in California and 31 other states (New 2003, Poulson 2004). The first state to enact a TEL was New Jersey in 1976. The New Jersey TEL limited state expenditure growth to growth in state income. Like other statutory TELs, the New Jersey TEL did not notably constrain state spending growth, and expired after six years in 1982 (Bails and Tieslau 2000, Poulson 2004).

State constitution TELs have been the most effective spending rules (New 2003, Poulson 2004). California's Gann Amendment was a 1978 ballot partner of the more famous Prop 13 property tax limit. The Gann TEL yielded a large 1987 tax rebate, but a series of constitutional amendments gutted Gann, as proved by rapid spending growth thereafter (Vock et al. 2009, Poulson 2009a), leading eventually to large budget gaps, several budget gap crises, significant tax increases, and finally to some recent large spending reductions.

As the Gann Amendment started its slide into irrelevance, Colorado amended its constitution with a Taxpayer Bill of Rights (TABOR), which limits the growth of available revenue to population growth plus inflation. Surplus revenue generates tax rebates. Higher tax rates and new debt require voter approval. TABOR also prohibits imposition of unfunded mandates on local governments. In the

[2]See Elder (1992), Kousser et al. (2008), Merrifield (2000), Merrifield and Monson (2011), Mitchell (2011), Mitchell and Tusyznski (2011), New (2001, 2003), Poulson (2004), Stansel (1994), and Stansel and Mitchell (2008).

[3]See Crain (2003), Holcombe and Sobel (1997), Krol (2007), Mitchell (2010), Mullins and Wallin (2004), Schunk and Woodward (2005), Shadbagian (1996), Wagner and Elder (2005), and Waisenan (2010).

1990s, revenue growth topped the TABOR limit enough to yield $3.25 billion in tax rebates. When the 2001 national recession caused actual revenue to fall below the TABOR limit, the resulting new benchmark and its ratchet-down effect on future spending growth yielded a 2005 referendum that imposed a five-year time-out from the TABOR growth limit and adjusted the annual limit formula to avoid future ratchet-down effects.[4] Though the TABOR experience suggests that political support for spending caps erodes with fiscal stress, Colorado voters remained unwilling to create a budget-stabilizing, but tax rebate-reducing, rainy day fund (RDF), a key source of TABOR critique (Poulson 2009a).

Budget Stabilization and Emergency Funds

Some of the recently proposed TELs earmark surplus revenue for an RDF and an emergency fund (EF). Forty seven states have some kind of RDF or EF, but rules governing deposits and withdrawals vary widely.[5] Wagner and Elder (2005) found that states with strict rules for RDF deposits and withdrawals experience a 20 percent reduction in spending volatility, as measured by the cyclical variability of per capita spending over time. Stansel and Mitchell (2008) found that states with stricter RDF withdrawal rules experienced less fiscal stress during the 2001 recession.

Capital Investment Funds

Capital expenditures tend to be very volatile over the business cycle. In periods of recession and revenue shortfall, state capital spending is typically among the first items cut. A binding TEL lacking a well-designed RDF may actually raise capital expenditure volatility over the business cycle, which occurred in Colorado (Poulson 2004). A solution to the volatility problem is a well-designed business stabilization fund (BSF) and a capital investment fund

[4]With a TEL-permitted growth rate of 5 percent per year and spending at $1 billion in year t, spending can rise to $1.05 billion in year t+1, and $1.1025 billion in year t+2. But, if in t + 1, there is a severe recession, revenues plummet to $800 million. The $800 million is the basis for the next 5 percent spending increase, leaving spending at $840 million in t+2 rather than at $1.1025 billion if an adequate RDF balance averts the cuts of year t+1.

[5]See Holcombe and Sobel (1997), Reuben and Rosenberg (2009), Wagner and Elder (2005, 2007), and Wagner and Sobel (2006).

(CIF) designed to stabilize capital spending over the business cycle. A good case for countercyclical capital expenditure exists without reliance on the well-known Keynesian stimulus argument. Because of the cyclical nature of construction quality and price (Finkel 1997, Merrifield and Monson 2011), our simulations earmark some surplus revenue for a CIF to finance additional construction spending in slow growth periods.

TELs and Tax Policy

A binding TEL will yield a mixture of tax rebates and lower tax rates. Despite the tedious nature of tax rebates, controversy over the basis for estimating the appropriate rebate for each taxpayer, and evidence that permanent tax cuts have larger economic growth effects than one-time rebates (Padquit 2011, Poulson and Kaplan 2008, Taylor 2008), it will probably take some persistence in the payment of rebates to elicit the permanent cuts. Indeed, Colorado's TABOR yielded large tax rebates for several years in the late 1990s, before state legislators responded with several permanent tax cuts.

Dynamic Scoring Foundations

The evidence that Colorado's TABOR accelerated economic growth (Poulson 2009a, 2009b) is controversial.[6] The controversy is over whether a drop in the state's share of personal income accelerates economic growth.[7] For 1980–90, Peterson (1994) estimated a 22.1 percent private rate and a 7 percent public rate of return. The 15.1 percentage point gap is a proxy for the marginal cost of shifting resources from the private to the public sector. Some studies (most recently Bania and Stone 2008) suggest that shifting resources from the private to the public sector can increase economic growth. But their findings may not be that useful to our TEL simulation. Bania and Stone omitted the effect of higher taxes on growth, and their large, heterogeneous productive services and infrastructure spending category obscures the likely effects of how spending would

[6]See, for example, Amiel et al. (2012), Deller et al. (2012), Lav (2009), Lav and Williams (2010), Lyons and Johnson (2006), Mcguire and Rueben (2006), Stallman and Deller (2010), and Stallman (2011).

[7]See Bergh and Henrekson (2011), Dahlby (1998), Ladner and Schlomach (2007), McBride (2012), Peterson (1994), and Spencer and Yohe (1970).

vary with or without a binding TEL. Studies of K–12 spending changes indicate that the Bania and Stone finding of a small positive impact on economic growth from greater spending on productive services and infrastructure may be a net effect of conflicting factors. Every state's disappointing K–12 performance indicates that there is much room for improvement, which is theoretically possible with additional resources. Though states continuously identify promising K–12 projects, Tomjanovitch (2004) found a significant inverse relationship between education spending and economic growth. Other studies suggest at least a normal marginal opportunity cost of shifting expenditure from the private sector to fund K–12 expenditures (Hanushek 1997, 2006; Hoxby 2004). Thus, our study's use of dynamic scoring assigns a positive economic growth effect to reduced spending and taxation.

Dynamic Scoring of Fiscal Policies for Budget Stability and Economic Growth

In our TEL proposal, we simulate the outcomes of a TEL that caps general fund (GF) spending growth at population plus inflation.[8] Our simulation template includes four key features excluded from the Schunk and Woodward (2005) TEL simulation. First, consistent with key issues cited in some of the recent TEL debates, our simulation allocates funds to an emergency fund and an RDF. Second, it funds countercyclical spending increases, including acceleration of capital spending. Our study is the second to examine the impact of codifying the pursuit of construction bargains during slow growth periods.[9] Third, our study is the first to extensively simulate the growth effects of reducing state income tax rates in the context of fiscal policy reforms. Our simulation revises personal income and future tax revenues when dollars shift between the public and private sectors, tax rates drop, or idle fund balances accrue interest payments.

[8]We confined our TEL's scope to GF spending because measures of total expenditures vary considerably among the states and special funds typically spend earmarked revenue. We use GF spending mostly to maintain comparability in measuring the impact of TELs on expenditures in the different states.

[9]The first study was Merrifield and Monson (2011). See Finkel (1997) for a discussion of construction bargains during sluggish growth.

Without tax rate reductions, our population plus inflation TEL generates large surpluses and rebates in years with high economic growth rates. Large, frequent tax rebates signal an opportunity to cut income tax rates, which we do in our second set of simulations. This means that spending still rises in all years, typically at the population plus inflation cap. We assess the sensitivity of our simulation findings to the opportunity cost of shifting resources from private to public use, and to uncertainty about the effects of income tax cuts on economic growth.

A Dynamic Scoring Model with Tax Rebates

Our first dynamic scoring model (equations 1–5) only has tax rebates. The annual spending growth limit is the sum of inflation and population growth rates. In all of our simulations, surplus revenue above that limit is prioritized as follows: emergency fund, rainy day fund, capital investment fund, and tax rebates. So, surplus funds flow to the EF until the balance reaches its target level. To limit the scope of our effort, we do not explore the sensitivity of our findings to changes in the EF cap (2 percent of GF for Montana and Utah, and 5 percent for California), or the occurrence of a major emergency.

(1) If $SURP_t > EDEF_t$, then $EMERG_t = TARGEM$
If $SURP_t < EDEF_t$, then $EMERG_t = (1 + r_t)\,(EMERG_{t-1} - DISAST_t) + SURP_t$,

where $SURP_t$ = surplus (RREV − RSPEND) in year t;
$EMERG_t$ = emergency fund balance in year t;
$EDEF_t$ = emergency fund deficit (i.e., the gap between the balance and target);
$EDEF_t = TARGEM_t + DISAST_t - EMERG_{t-1}$;
$DISAST_t$ = disaster spending in time t;
and TARGEM = target balance of emergency fund.

Surplus revenue left over after mandated EF deposits flow to the RDF until it reaches the account balance target. Based on the Holcombe and Sobel (1997) recommendation that the RDF have enough money to cover three consecutive worst-case revenue declines, and because the Great Recession was more severe than the basis for RDF norms, our default RDF target is an unusually high 25 percent of the GF spending level. Later, we use a more conventional 10 percent limit in a sensitivity analysis test of the importance of that parameter.

We prioritize EF deposits ahead of RDF deposits, so if the EF is below its target level, the first line of equation 2 only assigns interest payments to the RDF, and subtracts debits. The remainder of equation 2 assesses the net change in the RDF based on the availability of surplus funds, debits for budget stabilization, and the RDF account level relative to the account cap.

$$
\begin{aligned}
(2)\ &\text{If } EMERG_t < TARGEM, \text{ then } RDF_t = RDF_{t-1}(1 + r_t) - RDFDEB_t \\
&\text{If } EMERG_t \geq TARGEM, \text{ then} \\
&\quad \text{If } RDF_{t-1} \geq TARGRDF_t, \text{ then } RDF_t = RDF_{t-1} - RDFDEB_t \\
&\quad \text{If } RDF_{t-1} < TARGRDF_t, \text{ then} \\
&\qquad \text{If } RDF_{t-1}(1 + r_t) + AVSURP_t - RDFDEB_t < TARGRDF_t, \\
&\qquad\quad \text{then } RDF_t = RDF_{t-1}(1 + r_t) + AVSURP_t - RDFDEB_t \\
&\qquad \text{If } RDF_{t-1} + AVSURP_t - RDFDEB_t > TARGRDF_t, \text{ then} \\
&\qquad\quad RDF_t = TARGRDF_t,
\end{aligned}
$$

where RDF_t = rainy day fund balance in time period t;
$RDFDEB_t$ = RDF debit in time t;
$AVSURP_t$ = available surplus after emergency fund deposits;
and $TARGRDF_t$ = target balance for RDF.

RDF debits occur when revenue growth cannot sustain spending growth at population growth plus the rate of inflation. When there is a decline in revenue, money moves from the RDF to the GF. In particular, the transfer will be equal to half the drop in revenue from the previous year so that spending can rise faster than population plus inflation to meet the increased demand for unemployment compensation, welfare, and health expenditures in severe economic downturns. Consistent with our assessment of the literature, a CIF finances extra construction when recent personal income growth is below average personal income growth over the prior 10 years, with an annual withdrawal cap of 67 percent of the CIF balance—a cap that approximately balances CIF withdrawals and deposits over the business cycle.

The money accumulated in the various funds does not remain idle, but rather is invested in the private sector. Thus, there is no opportunity cost incurred until the money is transferred to the GF, which shifts resources from the private to the public sector. The RDF and EF balances earn interest at the rates recorded by the State Treasurer's Office. The interest earned grows the account balance until the account target is reached, and then interest earnings accrue to the GF. The basis for revising GF spending in accordance with our

TEL (equation 3) looks more complicated than it is. The model has to test for several possibilities to make sure that spending growth is as close to the population plus inflation rate as revenue plus the RDF account balance will allow.

(3) If $RREV_t \geq RREV_{t-1}$, then
If $RSPEND_{t-1}(CAP_t) < RREV_t$, then $RSPEND_t = RSPEND_{t-1}(CAP_t)$
If $RSPEND_{t-1}(CAP_t) > RREV_t$, then
If $RDF_t > RSPEND_{t-1}(CAP_t) - RREV_t$, then
$RSPEND_t = RSPEND_{t-1}(CAP_t)$
If $RDF_t < RSPEND_{t-1}(CAP_t) - RREV_t$, then
$RSPEND_t = RREV_t + RDF_t$
If $RREV_t < RREV_{t-1}$, then
If $RSPEND_{t-1}(CAP_t) + b(RREV_{t-1} - RREV_t) < RREV_t$, then
$RSPEND_t = RSPEND_{t-1}(CAP_t) + b(RREV_{t-1} - RREV_t)$
If $RSPEND_{t-1}(CAP_t) + b(RREV_{t-1} - RREV_t) > RREV_t$, then
If $RDF_t > RSPEND_{t-1}(CAP_t) + b(RREV_{t-1} - RREV_t) - RREV_t$, then $RSPEND_t = RSPEND_{t-1}(CAP_t) + b(RREV_{t-1} - RREV_t)$
If $RDF_t < RSPEND_{t-1}(CAP_t) + b(RREV_{t-1} - RREV_t) - RREV_t$, then $RSPEND_t = RREV_t + RDF_t$,

where $RREV_t$ = revised GF revenue for fiscal year t;
CAP_t = cap on GF spending growth rate for fiscal year t;
$RSPEND_t$ = revised GF spending for fiscal year t;
and b = share of revenue decrease to convert into countercyclical spending increase, RDF account balance permitting.

Our simulations employ a conservative estimate of 6 percent for the opportunity cost rate (Dahlby 1998) for shifting resources from the private to the public sector. Consistent with Barro (1990), we assume that the opportunity cost rate applies to small changes typical of marginal transfers of resources from private to public use. When our TEL reduces resource transfers from the private to the public sector, personal income rises (equation 4):

(4) $RPI_t = RPI_{t-1} + (API_t - API_{t-1}) + (OCR \times (SURP_t - EMERG_t))$,

where RPI_t = revised personal income in fiscal year t;
API_t = actual personal income in fiscal year t;
$SURP_t$ = GF surplus (RSPEND – RREV) in t;
$EMERG_t$ = emergency fund spending in t;
and OCR = opportunity cost rate (0.06, 0.09).

Personal income growth generates additional tax revenue for the GF (equation 5):

$$(5)\quad RREV_t = AREV_t + \Sigma_T ([RPI_t - API_t] \times [MTR_{Tt}]) + SI_t,$$

where $RREV_t$ = revised revenue for fiscal year t;
$AREV_t$ = actual revenue for fiscal year t;
MTR_{Tt} = marginal tax rate for state tax T in fiscal year t from Reed et al. (2011);
and SI_t = RDF and EF surplus interest.

A Dynamic Scoring Model with Income Tax Rate Cuts

The second dynamic scoring model analyzed in this study incorporates tax cuts alongside rebates of still-remaining surplus funds. Tax cuts impact economic growth more than tax rebates because of different behavioral responses. Tax rebates are seen primarily as transitory private income rather than permanent income. Transitory income mostly pays down debt, with little impact on consumption or investment spending. When permanent tax cuts impact permanent income, people raise their consumption and planned investment spending to a greater extent, and increase productive activity. Permanent tax cuts in one state relative to those in another state will also create incentives for mobility of labor and capital into that state.

Poulson and Kaplan (2008) measured the relationship between marginal tax rates and state economic growth. The marginal tax rate (MTR) is the increment in taxes paid when personal income rises. MTRs vary with tax structure (Reed, Rogers, and Skidmore 2011). The nationwide MTR is the average of the marginal rates levied in each state. Poulson and Kaplan (2008) find that a drop in the MTR in state X relative to others is associated with higher economic growth in state X. Their regression analysis indicates that a 1 percentage point decline in a state's aggregate MTR relative to the nation's average MTR increases that state's growth rate between 0.251 and 0.374 percentage points.

For our dynamic scoring simulations, we modify equation 1 to include a growth adjustment (GA) factor that is greater than one for years in which a permanent income tax rate cut is made (equation 6). GA_t for our California, Montana, and Utah models came from multiplying the conservative 0.251 percentage point impact of a 1 percentage point MTR change (Poulson and Kaplan 2008) by each state's annual state MTR (Reed et al. 2011) percentage point change.

(6) $RPI_t = RPI_{t-1}(GA_t) + (API_t - API_{t-1}) + (OCR \times (SURP_t - EMERG_t))$,

where GA_t = growth adjustment factor for fiscal year t, with $GA_t = 1 + (RMTR \times MTRCH_t)$;
RMTR = marginal tax rate reduction effect from Poulson and Kaplan (2008); and
$MTRCH_t$ = change in the Reed et al. (2011) state-level MTR_t.

A revised RREV (equation 7) accounts for the static revenue losses (SRLS) caused by a 1 percentage point cut in the income tax MTR.

(7) $RREV_t = AREV_t(1 - SRLS_t) + \Sigma_T([RPI_t - API_t] \times MTR_{Tt}) + SI_t$,

where $SRLS_t = (MTRCH_t/MTRINC_t) \times INCTAXPCT_t$;
$MTRINC_t$ = income tax MTR;
INCTAXPCT = the income tax share of total state GF revenue;
MTR_{Tt} = marginal tax rate for state tax T, like income tax and sales tax, which varies with the Reed et al. (2011) estimates, and with our prior simulated MTR reductions.

Our revenue estimates reflect the static revenue loss from tax rate reduction, and the increased revenue that results when lower tax rates increase the rate of growth in personal income.

Empirical Results

The states chosen for our simulation analysis have quite different tax structures and tax policies. Table 1 provides a three-state overview, where ~ indicates that the number is a generalization of simulation outcomes arising from different parameters.

All three states see a nearly 2 percentage point drop in the GF's share of personal income. The potential for tax rate reduction and commensurate gains in personal income vary widely between Utah (with its low potential to reduce tax rates and increase economic growth while still avoiding Great Recession budget cuts) and California and Montana (with their high potential to lower tax rates and avoid GF spending cuts). The California and Montana MTR reductions of about 2.4 percentage points amount to an approximately 50 percent drop in income taxation.

Seemingly small boosts to the rate of economic growth (0.251 to 0.374 percentage points) per percentage point of MTR reduction compound into significant changes over the 1994–2012 period, and in FY 2012. The TEL and dynamic scoring of tax rate reductions

TABLE 1
Three State Overview

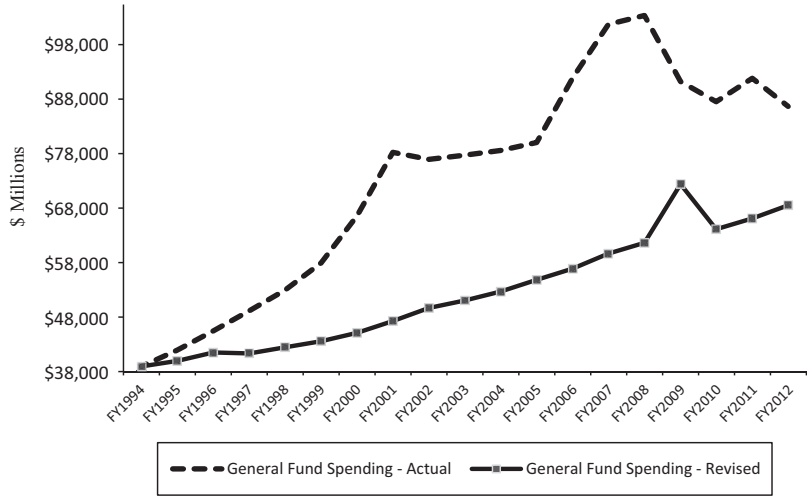
	California FY2012	CA 1994–2012 Cumul Δ	Montana FY2012	MT 1994–2012 Cumul Δ	Utah FY2012	UT 1994–2012 Cumul Δ
Marginal Tax Rate Drop (% points)	~0.4	~2.4	0	~2.3	0	0.4
Extra Personal Income (% points)	~8	~4	~6.5	~2.4	~0.33	~0.26
Drop in GF Share of PI (% points)		~1.67		~2		~1.67

yielded an approximate 8 percent rise in California's 2012 personal income, and 6.5 percent in Montana. The 1994–2012 cumulative gains were smaller because gains were smaller in the early years.

California

Our California simulation estimates what the state budget and personal income would look like had California added an RDF with an account balance cap at 10 or 25 percent and not abandoned the 1979 Gann spending limit in 1990. Our Gann-plus-RDF scenarios avoid tax hikes and budget crises while yielding large tax cuts and much larger state personal income. The 2009 spike in the Figure 1 revised/simulated spending reflects a temporary, counter-cyclical spending increase. So, the post-2009 drop does not violate our "no-cuts" constraint. Permanent spending increases every year.

FIGURE 1
California Actual and
Simulated Government Expenditures



Tables 2 and 3 describe simulated outcomes for FY 2012 and 1994–2012, respectively, with the growth adjustment rate (RMTR) at 0.251 percent.[10] In Tables 2 and 3 (4 and 5 for Montana and 6 and 7

[10]The higher estimates that result from the high-end RMTR of 0.374 percent, and the year-by-year California findings, are available at http://faculty.business.utsa.edu/jmerrifi/dsa.pdf.

TABLE 2
California, RTMR = 0.00251

FY2012 Counterfactual FY2012, Millions of 2012$	RDF Cap at 25% of GF 2.5 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.5 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.15 Inc Tax Rate Cut	RDF Cap at 25% of GF Rebates Only No Income Tax Cuts
Revised Personal Income, % of Actual	106.67%	106.69%	106.60%	101.25%
Additional FY 2012 Personal Income	$111,463	$111,675	$110,172	$20,796
Total Taxpayer Rebate	$0	$0	$0	$8,971
Revised Spending, % of Actual	76.43%	70.92%	77.02%	87.20%
Capital Investment Fund-End Balance	$554	$555	$555	$3,553
Budget Stabilization Funds,	$18	$9	$9	$18,826
% of Revised General Fund Spending	0.03%	0.02%	0.01%	24.99%
Emergency Funds	$3,410	$3,404	$3,410	$3,765
% of WC Emerg	99.16%	106.65%	98.40%	100.18%
Tax Cut-Induced Shortfall-Ratchet Down	8.51%	15.10%	7.80%	−4.39%

Personal Income Growth Rate Difference, Simulated Minus Actual, 1994–2012	0.364%	0.364%	0.360%	0.070%
Simulated Minus Actual, 1994–2008	0.336%	0.336%	0.336%	0.069%
Taxpayer Rebate per Capita 2012$ (not millions)	$0	$0	$0	$235
State Government Size				
Revised 2012 GF Spending, Share of PI	3.71%	3.44%	3.74%	4.46%
Actual in 1994	5.38%	5.38%	5.38%	5.38%
Actual in 2012	5.17%	5.17%	5.17%	5.17%
Actual in 2010	5.71%	5.71%	5.71%	5.71%
Actual in 2008	6.44%	6.44%	6.44%	6.44%

TABLE 3
California, RMTR = 0.00251

Cumulative Effects, 1994–2012 Millions of 2012$	RDF Cap at 25% of GF 2.5 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.5 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.15 Inc Tax Rate Cut	RDF Cap at 25% of GF Rebates Only No Income Tax Cuts
Cumulative Extra Personal Income, 1994–2012	$915,455	$915,867	$914,363	$170,424
% Increase over Actual 1994–2012 PI	3.27%	3.27%	3.27%	0.61%
Cumulative 1994–2012 GF Spending Decline	$470,174.72	$480,580.50	$475,311.91	$409,398.31
% of Total Actual, 1994–2012 Spending	28.00%	28.62%	28.30%	24.38%
Avg GF Spending Cap Shortfall	2.92%	5.23%	2.67%	0.00%
Avg GF Spending Cap Shortfall-SG	4.93%	5.34%	4.89%	0.00%
# of yrs Below GF Spending Cap	3	3	3	0

# of yrs Below GF Spending Cap-SG	16	16	16	0
Cumulative 1994–2012 Taxpayer Rebates	$59,037	$67,133	$67,133	$298,655
% of Total Actual, 1994–2012 Revenue	3.53%	4.01%	4.01%	17.84%
Cumulative 1994–2012 Tax Revenue Gain from Increased Growth	$48,918	$46,980	$47,304	$21,431
% of Total Revised, 1994–2012 Revenue	3.78%	3.64%	3.65%	1.26%

for Utah), the fourth (last) column describes the rebate-only outcomes with no income tax rate reductions. The heading of the first column in each table describes how many 1 percentage point cuts in the income tax MTR (Reed et al. 2011) are possible with the RDF cap set at 25 percent of projected GF spending without spending cuts in either the 2001–02 recession or the Great Recession, and growth in GF spending equal to population plus inflation in all other years. The second column shows how the outcomes of the simulation differ if the RDF cap is set at 10 percent. The third column indicates how many 1 percentage point cuts in the income tax MTR are possible with the RDF cap at 10 percent.

With the growth effects of the nearly 1 percentage point cut in the income tax MTR in 1996, a 0.6 percentage point cut in 1997, a 0.25 percentage point cut in 1998 and again in 1999, and another half percentage point drop in 2012 (2.5 total), with an RDF limit of 25 percent, without any spending cuts, California's simulated 2012 personal income is 6.67 percent ($111 billion) above the actual 2012 level—far above the no cut–rebate only 2012 gain of 1.25 percent, and something little changed by larger opportunity cost rates for shifting funds from the private to public sector. The 1994–2012 cumulative effect of the 2.5 percentage point MTR cut is $915 billion; 3.27 percent more than the actual personal income for the 18 years. With RMTR at the Poulson-Kaplan upper limit of 0.374 percent, the simulated 2012 personal income is $181 billion above actual personal income, with a 1994–2012 cumulative effect of $1.47 trillion. That growth yielded $72 billion in additional tax revenue over the 18 years. In 2012, in our most conservative scenario (RMTR = 0.00251, RDF at 25 percent), the California state government spends 1.67 percentage points less of personal income than in 1994.

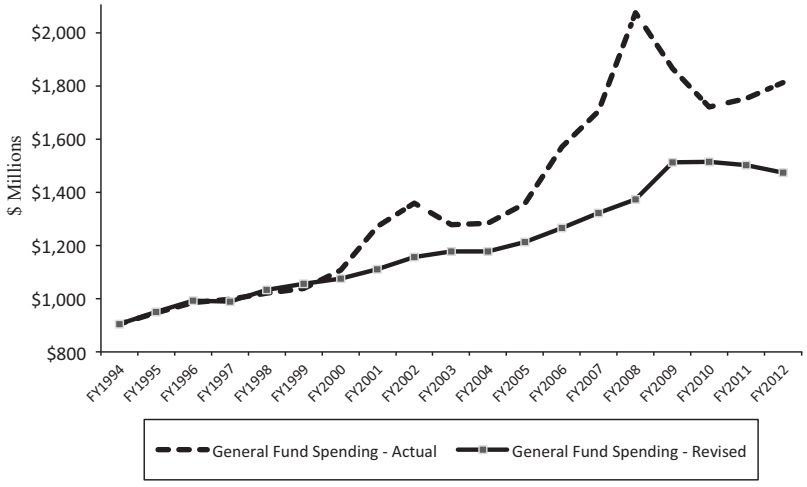
With RMTR = 0.00251, an RDF cap at 10 percent of GF spending yields some Great Recession spending cuts that the RDF cap of 25 percent would have avoided. To avoid those cuts, cumulative MTR reduction with an RDF cap at 10 percent must stop at 2.15 percentage points. Thus, in California, there would have been a trade-off between a 0.35 (= 2.5 − 2.15) point MTR reduction and the effects of much larger RDF account balances. Though actual cuts do not occur, spending rises by less than the cap in three fiscal years for a cumulative ratchet-down effect (less than the steady growth limit) of about 5 percent, varying slightly with the RDF cap and how much taxes are cut.

Montana

Montana is unusual in several ways. Over time, statewide elections yield a Republican-Democrat mix. Montana has no sales tax. It depends on volatile mineral severance and income tax revenue, typically spending up to those limits so that low-growth years, like the Great Recession, yield significant fiscal stress. Because the severance tax is state-income inelastic, the state income tax's MTR share is well above the income tax's share of state revenues. This fact underlies our simulation result that Montana could have managed a half percentage point cut in the income tax MTR in 2000, 2001, and 2003, plus a 0.25 percentage point reduction in 2002, 2004, and 2006 (2.25 points, total), with RMTR = 0.251 percent and the RDF account balance cap at 25 percent of projected GF spending. Those results would have been in addition to the actual 2005 income tax cut reflected in the data.

As in California, the population plus inflation spending cap yields large tax cuts and more income (Figure 2). The revised-simulated spending reflects temporary, Great Recession countercyclical spending increases, no violation of our "no-cuts" constraint.

FIGURE 2
Montana Actual and Simulated Government Expenditures



Tables 4 and 5, with RMTR = 0.251 percent, contain the 2012 simulated outcomes and cumulative effects for 1994–2012, respectively.[11] With the growth effects of the MTR reductions, with RMTR = 0.0025 and an RDF limit of 25 percent, Montana's simulated 2012 personal income is 4.96 percent ($1.8 billion) above the actual 2012 level, far above the no cut–rebate only 2012 gain of 0.47 percent. Again, the difference between cuts and rebates-only is little changed by larger opportunity cost rates for shifting funds from the private to public sector. The 1994–2012 cumulative effect of the 2.25 percentage point tax cuts and an RMTR of 0.00251 is $10.7 billion, 1.86 percent more than actual personal income. With RMTR at the Poulson-Kaplan upper limit of 0.374 percent, simulated 2012 personal income is $2.9 billion above actual personal income. The 1994–2012 cumulative effect is $16.6 billion. With the RMTR = 0.251 percent, the extra growth that would have resulted from the MTR reductions would have yielded $531 million in extra tax revenue over those 18 years. Because of a slight spending cut in 1997 (before the first simulated tax cut), and a Great Recession cap shortfall (not a spending decline), there is a 6.87 percent ratchet-down effect by 2012. In 2012, Montana's state government spent nearly 2 percentage points less of personal income than in 1994, nearly a full percentage point below the actual 2012 GF share of personal income. With RMTR = 0.00251 and the RDF cap at 10 percent, the cumulative MTR reduction has to be scaled back by 0.1 percentage points to avoid violating our no cuts constraint.

Montana's substantial severance tax revenues created a high-gain, low-pain combination for income tax cuts, which combined with spending restraint (at population plus inflation), allowed for a decline of nearly 50 percent in the income tax MTR, while maintaining budget stability and avoiding offsetting tax increases. The income tax cuts yielded significant additional economic growth.

Utah

For comparison to California and Montana, our definition of Utah's GF is the actual GF, funded mostly by the sales tax, plus the separate Education Fund, financed almost entirely by income taxes. Seemingly true to its conservative reputation, Utah had much less room for

[11]The higher estimates that result from the high-end RMTR of 0.374 percent, and the year-by-year Montana findings, are available at http://faculty.business.utsa.edu/jmerrifi/dsa.pdf.

TABLE 4
MONTANA, RMTR = 0.00251

FY2012 Counterfactual FY2012, Millions of 2012$	RDF Cap at 25% of GF 2.5 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.5 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.15 Inc Tax Rate Cut	RDF Cap at 25% of GF Rebates Only No Income Tax Cuts
Revised Personal Income, % of Actual	106.67%	106.69%	106.60%	101.25%
Additional FY2012 Personal Income	$111,463	$111,675	$110,172	$20,796
Total Taxpayer Rebate	$0	$0	$0	$8,971
Revised Spending, % of Actual	76.43%	70.92%	77.02%	87.20%
Capital Investment Fund-End Balance	$554	$555	$555	$3,553
Budget Stabilization Funds,	$18	$9	$9	$18,826
% of Revised General Fund Spending	0.03%	0.02%	0.01%	24.99%
Emergency Funds	$3,410	$3,404	$3,410	$3,765
% of WC Emerg	99.16%	106.65%	98.40%	100.18%
Tax Cut–Induced Shortfall-Ratchet Down	8.51%	15.10%	7.80%	−4.39%

continued

TABLE 4 (*cont.*)
MONTANA, RMTR = 0.00251

FY2012 Counterfactual FY2012, Millions of 2012$	RDF Cap at 25% of GF 2.5 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.5 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.15 Inc Tax Rate Cut	RDF Cap at 25% of GF Rebates Only No Income Tax Cuts
Personal Income Growth Rate Difference, Simulated Minus Actual, 1994–2012	0.364%	0.364%	0.360%	0.070%
Simulated Minus Actual, 1994–2008	0.336%	0.336%	0.336%	0.069%
Taxpayer Rebate per Capita 2012$ (not millions)	$0	$0	$0	$235
State Government Size				
Revised 2012 GF Spending, Share of PI	3.71%	3.44%	3.74%	4.46%
Actual in 1994	5.38%	5.38%	5.38%	5.38%
Actual in 2012	5.17%	5.17%	5.17%	5.17%
Actual in 2010	5.71%	5.71%	5.71%	5.71%
Actual in 2008	6.44%	6.44%	6.44%	6.44%

TABLE 5
MONTANA, RMTR = 0.00251

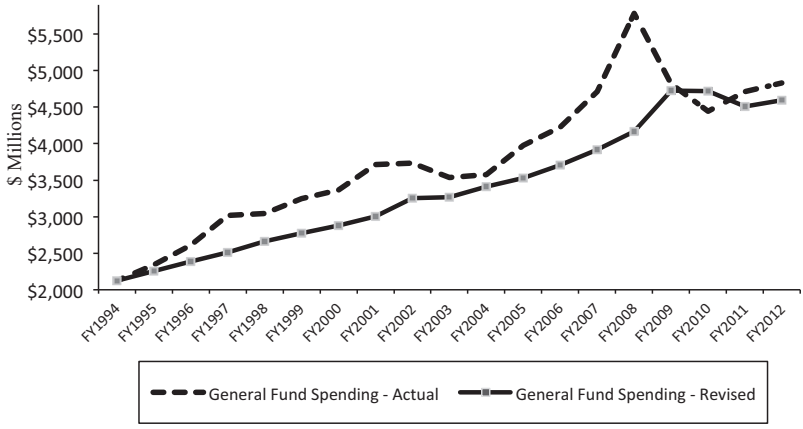
Cumulative Effects, 1994–2012 Millions of 2012$	RDF Cap at 25% of GF 2.25 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.25 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.15 Inc Tax Rate Cut	RDF Cap at 25% of GF Rebates Only No Income Tax Cuts
Cumulative Extra Personal Income, 1994–2012	$10,680	$10,697	$10,481	$984
% Increase over Actual 1994-2012 PI	1.86%	1.86%	1.82%	0.17%
Cumulative 1994–2012 GF Spending Decline	$3,484.66	$3,692.54	$3,602.22	$3,003.31
% of Total Actual, 1994–2012 Spending	11.12%	11.78%	11.49%	9.58%
Avg GF Spending Cap Shortfall	1.50%	2.13%	1.57%	4.26%
Avg GF Spending Cap Shortfall-SG	6.87%	7.65%	7.20%	4.67%
No. of yrs below GF Spending Cap	2	3	3	1
No. of yrs below GF Spending Cap-SG	12	12	12	16

continued

TABLE 5 (*cont.*)
Montana, RMTR = 0.00251

Cumulative Effects, 1994–2012 Millions of 2012$	RDF Cap at 25% of GF 2.25 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.25 Inc Tax Rate Cuts	RDF Cap at 10% of GF 2.15 Inc Tax Rate Cut	RDF Cap at 25% of GF Rebates Only No Income Tax Cuts
Cumulative 1994–2012 Taxpayer Rebates	$139	$324	$368	$2,436
% of Total Actual, 1994–2012 Revenue	0.44%	1.02%	1.16%	7.70%
Cumulative 1994–2012 Tax Revenue Gain from Increased Growth	$531	$542	$540	$113
% of Total Revised, 1994–2012 Revenue	1.89%	1.93%	1.92%	0.40%

FIGURE 3
Utah Actual and Simulated Government Expenditures



income tax reduction than California or Montana. Montana's maximum possible total income tax MTR reduction was 2.45 percentage points and California's was 2.5 percentage points. Utah could not maintain GF expenditure growth at population plus inflation because of a more than 0.4 percentage point drop in its income tax MTR in 1994–95, a revenue-neutral 2005 flattening of rates, and some minor cuts just before the Great Recession. Consequently, Utah suffered a relatively larger revenue drop in the Great Recession (Figure 3). Through 2008, Utah spent more of its personal income than California or Montana, and the Great Recession budget cuts put the personal income share of its GF at 5.01 percent, only slightly above where it would have been (4.75 percent) had Utah established an RDF with a 25 percent cap and steadily grown GF spending at population plus inflation—and well below the 6.53 percent share of personal income reached in 2008. With the growth that results from the 0.4 percentage points of reduction in Utah's income tax MTR, GF spending declines to 4.75 percent (varying slightly with RMTR and RDF cap) of personal income, more than half a percentage point higher than simulated 2012 levels for California and Montana. The results for Utah are presented in Tables 6 and 7 (with RMTR = 0.251 percent).

With the very small MTR reduction, the rebate-only outcome is slightly better. Note that the rebate-only simulation yields the actual 2012 GF personal income share (5.01 percent). Thus, Utah's actual GF

TABLE 6
Utah, RMTR = 0.00251

FY2012 Counterfactual FY2012, Millions of 2012$	RDF Cap at 25% of GF 0.4 Inc Tax Rate Cuts	RDF Cap at 10% of GF 0.4 Inc Tax Rate Cuts	RDF Cap at 10% of GF 0.4 Inc Tax Rate Cut	RDF Cap at 25% of GF Rebates Only No Income Tax Cuts
Revised Personal Income, % of Actual	100.31%	100.32%	100.32%	100.56%
Additional FY2012 Personal Income	$294.61	$312.92	$312.92	$544.66
Total Taxpayer Rebate	$0	$0	$0	$0
Revised Spending, % of Actual	95.15%	94.51%	94.51%	100.58%
Capital Investment Fund-End Balance	$90.32	$94.36	$94.36	$100.42
Budget Stabilization Funds,	$0.00	$0.02	$0.02	$945.89
% of Revised General Fund Spending	0.00%	0.00%	0.00%	19.46%
Emergency Funds	$90.32	$94.36	$94.36	$100.42
% of WC Emerg	0.95	1.00	1.00	1.00
Tax Cut-Induced Shortfall-Ratchet Down	6.35%	6.98%	6.98%	0.00%

Personal Income Growth				
Rate Difference,				
Simulated Minus Actual,				
1994–2012	0.02%	0.02%	0.02%	0.03%
Simulated Minus Actual,				
1994–2008	0.03%	0.03%	0.03%	0.04%
Taxpayer Rebate per Capita				
2012$ (not millions)	$0	$0	$0	$0
State Government Size				
Revised 2012 GF				
Spending, Share of PI	4.75%	4.72%	4.72%	5.01%
Actual in 1994	6.37%	6.37%	6.37%	6.37%
Actual in 2012	5.01%	5.01%	5.01%	5.01%
Actual in 2010	5.08%	5.08%	5.08%	5.08%
Actual in 2008	6.53%	6.53%	6.53%	6.53%

TABLE 7
Utah, RMTR = 0.00251

Cumulative Effects Millions of 2012$	RDF Cap at 25% of GF 0.4 Inc Tax Rate Cuts	RDF Cap at 10% of GF 0.4 Inc Tax Rate Cuts	RDF Cap at 10% of GF 0.4 Inc Tax Rate Cut	RDF Cap at 25% of GF Rebates Only No Income Tax Cuts
Cumulative Extra Personal Income, 1994–2012	$3,602.25	$3,647.60	$3,647.60	$5,339.78
% Increase over Actual 1994–2012 PI	0.25%	0.25%	0.25%	0.37%
Cumulative 1994–2012 GF Spending Decline	$9,001	$9,415	$9,415	$9,924
% of Total Actual, 1994–2012 Spending	10.39%	10.87%	10.87%	11.45%
Avg GF Spending Cap Shortfall	3.21%	3.54%	3.54%	−0.24%
Avg GF Spending Cap Shortfall-SG	5.74%	5.31%	5.31%	5.27%
# of yrs Below GF Spending Cap	2	2	2	2
# of yrs Below GF Spending Cap-SG	2	3	3	3

Cumulative 1994–2012 Taxpayer Rebates	$4,277	$4,494	$4,494	$7,688
% of Total Actual, 1994–2012 Revenue	4.92%	5.17%	5.17%	8.85%
Cumulative 1994–2012 Tax Revenue Gain from Increased Growth	$932.50	$869.27	$869.27	$1,142.21
% of Total Revised, 1994–2012 Revenue	1.12%	1.05%	1.05%	1.30%

spending ultimately increased by population plus inflation from 1994 to 2012, but without the economic growth effects of tax cuts and rebates found in our simulations, and via a stressful fiscal roller coaster that peaked in 2008 with GF spending at 6.53 percent of personal income.[12]

Conclusion

We used a dynamic scoring simulation model to explore state fiscal policies to stabilize budgets and promote economic growth. The simulations combine tax and expenditure limits and rules for the disposition of surplus revenue to an emergency fund, rainy day fund, capital fund, and taxpayer rebates. The simulations measure the potential for income tax cuts with those rules in place, and the impact of the cuts possible while maintaining budget stability.

All of the simulations indicate significant gains from budget stabilization with spending restraint, including improved emergency preparedness, tax relief, and accelerated economic growth. The fiscal rules simulated in this article also capture the unique tax structure and tax policies in each of the states, including changes in tax structure, a first for this type of study.

With these fiscal rules in place, California and Montana could have greatly reduced income tax rates. Those cuts could have raised the personal income annual growth rate by over one-third of a percentage point in California and in Montana. The 1994–2012 cumulative personal income gains could have been over 3 percent in California and over 2 percent in Montana, substantial rates consistent with McBride's (2012) survey findings. Utah needed greater savings to avoid budget cuts during the Great Recession, so the potential for tax cuts within the parameters of the model were more limited.

Our findings indicate that California would have seen the most dramatic state spending reductions—a cumulative reduction of about 28 percent over the period as a whole. The evidence of rapid growth in state spending after California abandoned the Gann Amendment helps explain why our fiscal rules have such a large impact in California. In Montana and Utah, the cumulative reduction in state spending over the period would have been more modest, about 11 percent and 10 percent, respectively.

[12]The higher estimates that result from the high-end RMTR of 0.374 percent, and the year-by-year Utah findings, are available at http://faculty.business.utsa.edu/jmerrifi/dsa.pdf.

A major issue in the debate over tax policy is the supply-side impact of income tax rate cuts. Using the Poulson and Kaplan (2008) estimates of the negative relationship between marginal tax rates and state economic growth, we show that income tax cuts could significantly increase economic growth and that the resulting tax revenue growth would have offset much of the static revenue loss. California could have seen a tax revenue dividend of about 4 percent, while Montana and Utah could have experienced dividends of about 2 percent and 1 percent, respectively.

In the years prior to the Great Recession, despite income tax cuts, RDF deposits, and capital fund deposits, California and Utah still had enough surplus revenue for large tax rebates. The tax cut and rebate-only simulation differences reveal the importance of income tax cuts.

For a policy choice between slight spending reductions in major economic downturns with RDF caps set at 10 percent of projected GF spending and RDF caps set at 25 percent to sustain GF growth through all major downturns, we lean toward the former. Large RDF balances raise the importance of state treasurer acumen as a private-sector investor, and large RDF balances provide tempting targets for rent-seekers whose actions could undermine the legal and political foundations of TEL-RDF regimes. Infrequent periodic pressures to trim spending are healthy provided they stay below the fiscal stress threshold that would prompt tax increases and TEL erosion.

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