ENSURING THAT ARIZONA STATE GOVERNMENT'S BUDGET STABILIZATION FUND SERVES ITS PURPOSE

A Report from the Office of the University Economist

June 2012

Dennis Hoffman, Ph.D.
Professor, Department of Economics; Director, L. William Seidman Research Institute;
and Director, Office of the University Economist

Tom Rex, M.B.A.
Associate Director, Center for Competitiveness and Prosperity Research;
and Manager of Research Initiatives, Office of the University Economist

Center for Competitiveness and Prosperity Research
L. William Seidman Research Institute
W. P. Carey School of Business
Arizona State University
Box 874011
Tempe, Arizona 85287-4011

(480) 965-5362
FAX: (480) 965-5458
EMAIL: Dennis.Hoffman@asu.edu or Tom.Rex@asu.edu
wpcarey.asu.edu/research/competitiveness-prosperity-research
economist.asu.edu

ASU W. P. CAREY SCHOOL of BUSINESS
ARIZONA STATE UNIVERSITY

TABLE OF CONTENTS

LIST OF TABLES

LIST OF CHARTS

SUMMARY

The purpose of Arizona state government's budget stabilization fund is to reduce the fluctuations in general fund revenue caused by the economic cycle. These fluctuations result in large budget surpluses in some years and large deficits in other years. Thus, revenues are saved in the budget stabilization fund during periods of strong economic growth and are transferred back to the general fund during periods of weak economic growth or decline. A recommended amount to transfer is based on a formula that compares recent economic performance to an average growth rate, but the Legislature can override the recommendation.

Saving revenue during a period of strong economic growth discourages spending increases and/or revenue reductions that are not sustainable over an entire economic cycle. However, the primary intent of the budget stabilization fund, which was created in 1990, was to substantially reduce, if not eliminate, spending cuts during recessions. Spending reductions during recessions not only diminish the quality and/or quantity of public services at a time when many Arizonans are most in need of assistance, but also have a depressing effect on an already weak economy. However, in each of the two recessions since the creation of the budget stabilization fund, the balance in the fund has been insufficient to meet the needs, forcing substantial reductions in expenditures to be made in order to balance the budget.

Most of the revenue shortfalls in the last two recessions resulted from the numerous reductions in taxes and other revenues passed by the Legislature since 1990 that created a structural deficit. The substantial reductions in spending implemented during the last few years largely resolved the existing structural deficit. However, recently passed tax reductions that will phase in during the next several years, and the end of the temporary sales tax in 2013, will result in a new structural deficit that will necessitate additional large spending reductions the next time the economy slows. Moreover, the changes to the revenue system have increased the cyclicality of revenue flows. The budget stabilization fund was created when revenues were less cyclical and was not designed to offset a structural deficit.

Legislative modifications to the original budget stabilization fund statute also have contributed to the need for large spending reductions during the last two recessions. These changes have had the effect of reducing the amount of money transferred to the general fund during recessions. The maximum amount of money that can be held in the budget stabilization fund was reduced and the formula that recommends the amount to transfer back to the general fund was modified.

Without considering the structural deficit, the budget stabilization fund almost certainly will not have the funding necessary to offset the cyclical reduction in revenue that will occur during the next recession. In order to make recommendations to improve the functioning of the budget stabilization fund, simulations of the operations of the fund going back to the early 1970s were made.

One simulation used the provisions of the original 1990 legislation. A second simulation used the specifications of the current statute. These simulations reveal a significant shortcoming present in both the original and current statutes: the amount transferred to the budget stabilization fund during economic expansions generally is inadequate to offset the revenue shortfalls during recessions, even without considering the structural deficit.

In addition, the provisions of the current statute impair the functioning of the budget stabilization fund in two ways that were not present in the original statute. First, transfers to the general fund from the budget stabilization fund are restricted to years of significant economic weakness. Second, the limit on the amount of money that can be saved in the budget stabilization fund is only 7 percent, compared to the original statute's 15 percent limit. This low cap means that the budget stabilization fund will be depleted before the end of the economic downturn in nearly all cycles.

In a third simulation, the formula that recommends the amount of money to be transferred to or from the budget stabilization fund was modified and no cap was applied. This simulation demonstrates that it is possible to transfer an adequate amount to the budget stabilization fund during economic expansions to meet the needs during the subsequent economic downturn in most economic cycles. It also indicates that a 15 percent limit on the fund is reasonable if the intent of the fund is only to smooth out the fluctuations in revenue caused by the economic cycle.

The functioning of the budget stabilization fund could be improved in three ways:

- The formula used to calculate the amount to be transferred to or from the fund should be changed. More money should be transferred to the fund during economic expansions and restrictions limiting transfers to the general fund during periods of economic weakness should be removed.
- The limit on the balance of the fund needs to be raised to the original 15 percent.
- The fund needs to be protected from the legislative use of its funds for purposes other than for which it was designed. In addition, transfers to and from the fund should be made automatically rather than be subject to legislative action. The integrity of the fund could be protected by specifying the operation of the fund in the Arizona Constitution.

More broadly, other changes could be made to the state's fiscal system that would reduce the pressure on the budget stabilization fund and the need to reduce general fund expenditures during economic downturns:

- The general fund's revenue system should be broadened so that it is less dependent on highly cyclical sources of revenue.
- The structural deficit should be addressed by requiring that any legislated revenue reduction be accompanied by a concurrent and commensurate reduction in spending. Similarly, any increase in spending should be accompanied by a concurrent and commensurate increase in revenue.
- Other contingency funds should be created to handle fiscal emergencies other than the reduction in revenue during economic downturns.

If the purpose of the budget stabilization fund were broadened to not only compensate for cyclical losses in revenue but also to offset countercyclical increases in demand for public assistance, the formula used in the third simulation would have to be changed to transfer more money into the budget stabilization fund during economic expansions and the cap on the fund would need to be much higher than 15 percent. Even in this case, spending reductions would be necessary during an economic downturn if a structural deficit exists.

INTRODUCTION

The financing of Arizona's state government is accomplished through the use of numerous funds. Most of these funds are relatively small, have dedicated funding sources, and are used for specific purposes. An example is the State Aviation Fund, which is used for the construction and improvement of airports in Arizona. It is funded by the aviation fuel tax.

Those functions of state government that are not financed through such specific funds are included in the general fund. Revenues —mostly from the sales tax and the income tax — are deposited in the state government general fund. These revenues are appropriated by the Arizona Legislature for a variety of purposes, most notably education, corrections, and public health and welfare programs. The Legislature has more discretion over the general fund than other funds.

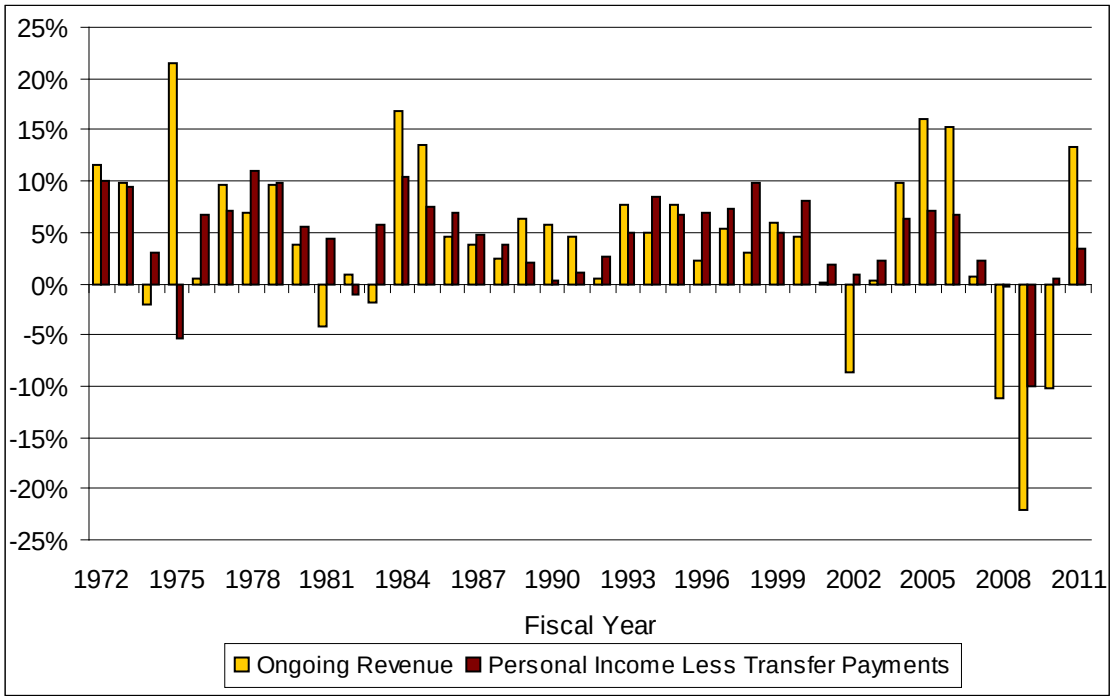
General fund revenues are highly cyclical, rising more during years of strong economic growth and increasing less or falling during years of weak economic growth or economic decline. This high revenue cyclicality results in part from Arizona's disproportionately cyclical economy and in part from the structure of the revenue system that supports the general fund. As a result of this revenue cyclicality, the general fund frequently has a large annual surplus or deficit. Since state government cannot run a deficit, either spending must be reduced or revenues enhanced during years of weak economic performance.

The cyclicality of the Arizona economy is displayed in Chart 1, with inflation-adjusted ("real") economic growth measured by personal income less transfer payments. (Personal income includes the income received by persons from all sources. Transfer payments consist of income payments to persons for which no current services are performed, such as retirement income.) Inflation-adjusted state government general fund revenue growth also is shown in Chart 1, as measured by "ongoing" revenue, which excludes one-time adjustments. Real revenue flows are more volatile than economic growth — for example, note the stronger revenue growth in the mid-2000s and the larger decreases that followed.

The relationship between revenue growth and economic growth shown in Chart 1 is affected by the large number and magnitude of tax law changes made over the decades. For example, despite the economic recession, revenue soared in fiscal year (FY) 1975 due to a tax increase. Revenue rose less than economic growth in each year from FYs 1996 through 2000 due to permanent reductions in various taxes. Similarly, though the large declines in revenue in 2002 and 2008 through 2010 largely resulted from economic conditions, tax cuts in immediately preceding years also contributed.

Arizona's Budget Stabilization Fund (BSF or "the fund"), which was created in 1990, is fundamentally different from other funds. Instead of funding one or more state government functions on an ongoing basis, the BSF is in essence a contingency fund or a savings account, intended to smooth out the fluctuations in the revenue stream over an economic cycle. In years in which economic growth exceeds the long-term average, general fund revenues typically exceed appropriations. The "excess" revenue is saved by transferring it into the BSF. In years in which economic growth is less than the long-term average, monies are transferred from the BSF to the general fund to supplement the reduced amount of actual revenues.

CHART 1
STATE GENERAL FUND REVENUE AND ECONOMIC GROWTH IN ARIZONA
Annual Inflation-Adjusted Percent Change



Source: Arizona Joint Legislative Budget Committee (ongoing revenue) and the U.S. Department of Commerce, Bureau of Economic Analysis (personal income less transfer payments and the GDP implicit price deflator).

Nearly all states have some form of a budget stabilization fund (also known as a "rainy-day" fund). Since all but one state must maintain an annual balanced budget, the ability to tap into a savings account when revenues decline minimizes the extent of the spending cuts or revenue increases that must be implemented to balance the budget. Reducing public spending or increasing taxes during periods of economic weakness deepen and lengthen an economic recession. Further, as individuals and families experience job losses and other reductions in income during a recession, demand for public assistance rises. Thus, a reduction in spending during a recession is particularly harmful to those who are most need of public assistance.

THE SPECIFICATION OF THE BUDGET STABILIZATION FUND IN STATUTE

The BSF is authorized in section 35-144 of the Arizona Revised Statutes. The State Treasurer administers the fund. Interest earnings from invested BSF monies are credited to the fund.

An important provision of the statute is that "the monies in the fund are separate monies to be used only for the purposes of the fund." The primary purpose of the fund is to receive general fund revenues in years of strong economic growth and to transfer monies back to the general fund in years of weak economic growth or economic decline. In addition, the State Treasurer may temporarily divest monies in the BSF to avoid a negative cash balance in the general fund.

Included in the statute is a formula that calculates the recommended annual amount to transfer to or from the BSF. However, deposits to, and withdrawals from, the BSF are not made automatically according to the formula. Instead, the Legislature must authorize the transfers. A two-thirds vote of the Legislature is required to reduce the recommended amount for transfer to the BSF or increase the amount for transfer from the BSF to the general fund.

The formula that calculates the recommended amount of transfers to and from the BSF is based on a comparison of economic growth in the most recent calendar year to the seven-year average. Economic growth is defined as the percent change in personal income minus its transfer payments component, adjusted for inflation. The source of these data is the U.S. Department of Commerce's Bureau of Economic Analysis (BEA). Estimates of personal income, transfer payments, and the gross domestic product implicit price deflator for the preceding calendar year are released by the BEA in the spring.

The statute specifies that these annual data be used by the Economic Estimates Commission to calculate the annual percent change in inflation-adjusted personal income minus transfer payments in the latest year. The seven-year average also is calculated. If the annual percent change is greater than the average of the most recent seven years, then a transfer from the general fund to the BSF is recommended. According to the original formula, if the annual percent change in economic growth was less than the seven-year average, a transfer from the BSF to the general fund was recommended. Subsequent legislation limited transfers from the BSF to the general fund to years in which the annual economic growth rate was less than the seven-year average *and* less than 2 percent.

The difference between annual economic growth and trend growth is multiplied by the amount of general fund revenue in the preceding fiscal year to determine the amount to transfer to or from the BSF. Transfers between the BSF and the general fund are to be made prior to the end of the fiscal year in June.

In the original statute, the balance in the BSF at the end of a fiscal year could not exceed 15 percent of the current year's general fund revenue. An excess was transferred to the general fund. Thus, if a formula-recommended transfer would push the BSF balance beyond 15 percent, the size of the transfer would be scaled back commensurately. The fund also could exceed the cap due to interest earnings, requiring the excess to be transferred to the general fund. In 1995, the limit was reduced to 5 percent. Beginning in 1997, the limit was gradually raised over a three-year period to 7 percent.

Proposals to change the operation of the BSF continue to be made. For example, in the 2012 legislative session, two pieces of legislation were proposed that would have substantially changed the operation of the BSF. Neither passed. House Bill 2791 proposed eliminating the formula for determining the amount to be deposited in the BSF. Instead, the BSF would have been the fifth priority for use of excess revenues, with the Legislature not receiving any guidance as to the amount to transfer. House Concurrent Resolution 2037 proposed eliminating the formula for transferring monies from the BSF to the general fund. It effectively would have restricted the use of the money saved in the BSF, not allowing a transfer to be made until

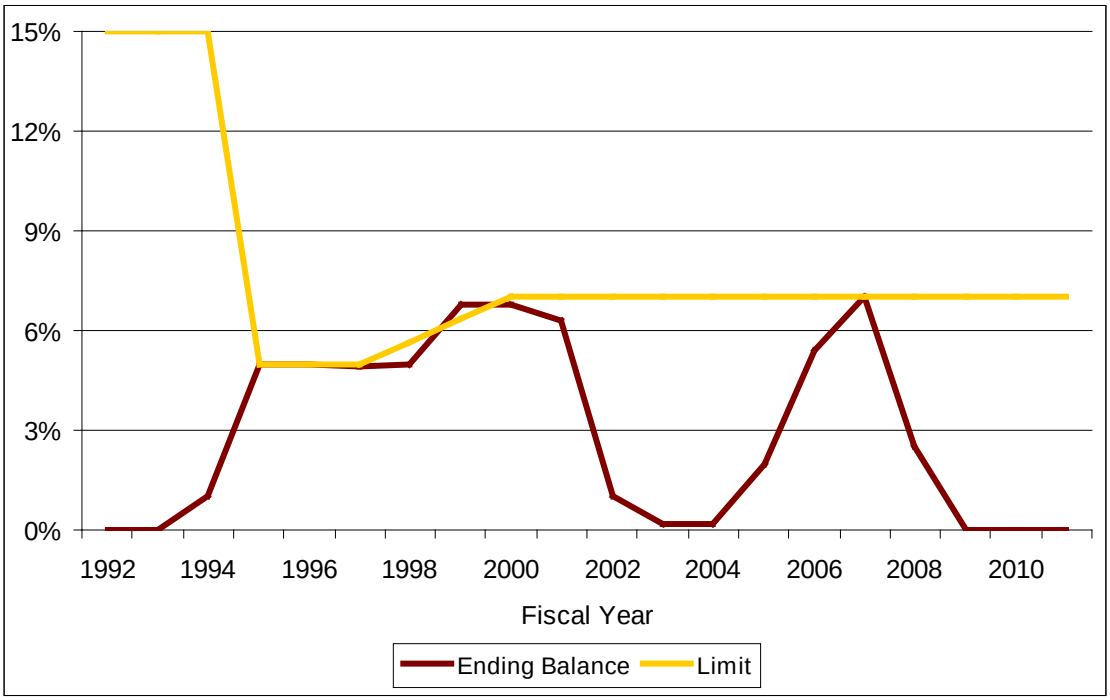
spending reductions had been made. It also authorized the use of the BSF for catastrophic natural disasters.

ACTUAL TRANSFERS TO AND FROM THE BUDGET STABILIZATION FUND

This section is based on an annual summary of the BSF produced by the Arizona Joint Legislative Budget Committee (JLBC). The state was in the midst of a long economic downturn when the BSF was created in 1990. Though the formula called for transfers from the BSF to the general fund through fiscal year 1993, these transfers did not occur since no money was deposited in the fund when the BSF was created.

It was not until FY 1994 that the first deposit was made to the BSF. This deposit was less than recommended by the formula. (In only one year — FY 1995 — has the recommended transfer been authorized by the Legislature.) In FY 1995, the cap was lowered to 5 percent and the fund reached the 5 percent limit (see Chart 2). While the dollar limit of the BSF rose a little between FYs 1995 and 1997 because of the increase in revenues (before adjustment for inflation or population growth) on which the limit is based, the fund's interest earnings kept the balance at the limit. Thus, though the formula called for additional transfers to the BSF in FYs 1996 and 1997 of nearly $350 million, no transfers were made. Instead of depositing money to the BSF, the Legislature instead implemented permanent tax reductions based on the temporary revenue surpluses.

CHART 2
ENDING BALANCE IN THE BUDGET STABILIZATION FUND
AS A PERCENTAGE OF GENERAL FUND REVENUE



Source: Arizona Joint Legislative Budget Committee.

The gradual increase in the cap from 5-to-7 percent between FYs 1997 and 2000 allowed a portion of the recommended deposits to the BSF to be made in FYs 1998 and 1999. The BSF balance was approximately 7 percent of the general fund in FYs 1999 and 2000.

With a weakening economy, the formula indicated that transfers between the BSF and the general fund should be minimal in FYs 2000 and 2001. Due to the recession during calendar year 2001 and the weak recovery from the recession during the following couple of years, the formula indicated that withdrawals from the BSF accumulating to more than $600 million should be made during the next three years (through FY 2004). Instead, the Legislature began withdrawals in FY 2001 and largely drained the BSF in FY 2002. A total of $455 million was transferred to the general fund over FYs 2001 through 2003. Thus, the 7 percent balance in the BSF was inadequate to fully fund the recommended transfers during this relatively mild recession.

An improving economy caused the formula to indicate that deposits to the BSF be made in FYs 2005 through 2007. The Legislature made more substantial deposits than recommended to the BSF during these economic boom years, putting the BSF balance at its 7 percent limit in FY 2007.

As the economy slipped into recession in FY 2008, the formula suggested that a transfer from the BSF to the general fund be made. Much larger transfers were called for in FYs 2009 and 2010, with an additional transfer indicated in FY 2011. However, the Legislature withdrew substantially more from the BSF in FY 2008 than recommended and depleted the fund in FY 2009. The withdrawals totaled a little more than $700 million, but the formula called for a total of more than $1.3 billion be withdrawn through FY 2011. Thus, in both economic downturns since the creation of the BSF, the amount that had been deposited in the BSF was substantially inadequate to provide the transfers called for by the formula.

ISSUES RELATED TO THE BUDGET STABILIZATION FUND

Alberta Charney of the University of Arizona raised several issues in her August 2003 paper "Budget Stabilization Fund: Cap Size and Other Issues," identifying five ways in which the existing statute failed to ensure that adequate funds would be available during an economic downturn:

- The limit of 7 percent is too low to cover the needs of just one year of a typical revenue downturn.
- Downturns typically have lasted more than one fiscal year.
- The change in the formula to allow transfers to the general fund to occur only when real growth in personal income less transfer payments is less than 2 percent can result in no transfer to the general fund even during recessionary years.
- While the original design considered revenue fluctuations, it did not incorporate the countercyclical demands for public funds.
- The Legislature is not prevented from using the BSF for purposes unrelated to fluctuations in revenues.

In addition, Charney discussed the possibility of altering the general fund's revenue mix in order to reduce the cyclicality in revenue. She also noted that permanently reducing revenues during

years of temporary revenue surpluses results in a greater need to bolster revenue during subsequent economic downturns.

Tom Rex of Arizona State University offered "Further Thoughts on the Budget Stabilization Fund and Other Contingency Funds" in October 2003. An additional problem with the BSF was identified: the formula-recommended payments to the BSF during economic expansions are generally inadequate to attain a BSF balance of 15 percent before the next economic downturn.

These papers were written for the Citizens Finance Review Commission (CFRC). The purpose of the CFRC was to "develop a series of recommendations that will advise the Governor on a course to stimulate Arizona's economy for the long term. In particular, the Commission will develop recommendations that address fiscal and tax policies that are simple, low and fair and support Arizona's growing economy." The 21 members of the CFRC represented numerous groups; none were elected officials. Among the numerous recommendations made by the CFRC in 2004, one covered the BSF: "the state should increase the current limit on the budget stabilization fund to its original 15 percent cap and take measures to make 'raids' on the fund more difficult." The CFRC report is available at http://azmemory.lib.az.us/cgi-bin/showfile.exe?CISOROOT=/statepubs&CISOPTR=279&filename=280.pdf.

Charney also wrote about the BSF in the November 2009 Arizona Town Hall's background report "Riding the Fiscal Roller Coaster: Government Revenue in Arizona" (see Chapter 17 at http://www.aztownhall.org/95). Given the lack of action to reform the BSF despite the CFRC's recommendation, most of her discussion mirrored that of the 2003 paper. However, she noted a couple of practical problems with the existing statute that had not previously been discussed.

First, the application of the formula by the Economic Estimates Commission does not occur until late in a fiscal year, which can create cash-flow problems during a fiscal year with a weak economy. (However, the State Treasurer has the authority to use the BSF to avoid a negative cash balance.) Second, the formula is based on data for the period from 6-to-18 months prior to the end of the fiscal year. Economic conditions can change rapidly, particularly during the transition into and out of a recession. Thus, the formula's recommendations may not reflect current conditions or expected conditions.

These topics can be grouped into five issues. Three directly relate to the functioning of the BSF:

- Formula for calculating transfers
- Size of the cap
- Integrity of the BSF

The other two issues are broader in nature:

- Cyclicality of revenues and the countercyclicality of demand
- Structural deficit resulting from revenue reductions

Cyclicality of Revenues and Countercyclicality of Demand

Part of the cyclicality in general fund revenues results from the high cyclicality of Arizona's economy. Thus, if economic volatility could be reduced, revenues would not fluctuate as much, reducing the need for a sizable BSF.

Economic volatility is in part related to economic diversity, which is in turn largely a function of economic size. For example, a small town that is highly reliant on one or a few industries, such a copper mining community in Arizona, is subject to severe economic swings. More populous areas, such as metro Phoenix and the state, naturally have more diverse economies. While many advocate for expanding the diversity of the state's economy, the reality is that the economy already is reasonably diverse.

The high economic cyclicality in Arizona and in its major urban areas instead is more related to its rate of growth. Fast-growing areas naturally have larger construction and real estate sectors, activities that inherently are highly cyclical. All of the states with highly cyclical economies are states that are growing rapidly. Thus, short of artificially restraining growth, it is not feasible for public policy to substantially reduce the cyclicality of Arizona's economy.

The other primary reason for the cyclicality in the general fund's revenues is the revenue structure itself. Some types of revenue are much more cyclical than others. Two cyclical revenue sources — the sales tax and the income tax — have accounted for about 90 percent of general fund revenues in recent years.

General fund revenues have become more cyclical over the last 20 years due to the multitude of changes to the revenue structure that have been implemented over this period. Relatively stable sources of revenue have experienced rate reductions, if not outright elimination as a source of general fund revenues. For example, the general fund no longer receives revenue from sources such as the estate tax and the vehicle license tax and receives hardly any revenue from the property tax. The general fund has become more reliant on the sales tax, which is a highly cyclical source of revenue. (Sales tax revenue also does not keep pace with economic growth since most services and online purchases — which are increasing shares of consumer expenditures — are not taxed.)

Thus, it would be possible to reduce the cyclicality of general fund revenues, and the need for a large BSF balance, by broadening the tax base. This could be done in a revenue-neutral way by reducing the tax rates on taxes that currently are highly utilized and adding other sources of revenue for the general fund. The CFRC made a number of recommendations along this line in 2004.

Since the countercyclicality of demand for public programs is a function of the economic cycle, public policy can have little effect in dampening the increase in demand. The magnitude of the increase in demand conceptually could be reduced, but in reality such a lessening of demand will be a difficult and time-consuming process. Charney recommended increasing the amount of money saved in the BSF so that the BSF could accommodate countercyclical rises in demand as well as cyclical declines in revenue.

Structural Deficit

After adjusting for inflation, population growth, and economic growth, general fund revenues were reduced by about $3 billion due to legislative choices made during the 1990s and 2000s. Most of the reductions occurred from FYs 1995 through 2001 and in FYs 2007 and 2008. The largest tax reductions were passed during years of revenue surpluses. However, these surpluses

were temporary and due to cyclical factors, while the tax reductions were permanent in nature. Though spending was reduced during the years in which revenues were cut, the size of the spending cuts did not match the revenue reductions. Thus, a structural deficit was introduced.

Adding new spending requirements to the general fund without raising revenues also contributed to the structural deficit. A primary example is that a substantial portion of funding for school repairs and construction was shifted to the general fund in FY 1999, without any increase in revenue.

The structural deficit that was created during the 1990s and 2000s greatly contributed to the revenue shortfalls that the state general fund has experienced during the last two economic recessions. Given the small balance in the BSF and the large reduction in revenue due to cyclical factors and the many tax cuts, spending reductions therefore had to be disproportionately large during the two recessions. Spending cuts were particularly deep during the last recession. The scaling back of the size of state government had the effect of deepening and lengthening Arizona's already severe recession.

Assuming that the spending reductions implemented during the recent recession are permanent, the pre-existing structural deficit has largely been eliminated — temporarily. However, the temporary sales tax increase is slated to end in May 2013 and the Legislature has continued to pass revenue reductions — reductions of approximately $650 million once fully phased in were passed during the 2011 and 2012 legislative sessions. Thus, the structural deficit will again grow during this economic expansion, leading to a need to make more spending cuts during the next recession, thereby making the recession worse. Again, the state will fail to provide services to its citizens when they most need assistance.

The solution is to require that all future revenue reductions be accompanied by a commensurate amount of spending reductions that are implemented concurrently. Similarly, any increases in spending need to be accompanied by a concurrent increase in revenue.

Integrity of the Budget Stabilization Fund

The integrity of the BSF has been threatened in three ways. First, legislative changes to the BSF statute — reducing its cap and raising the requirement to transfer monies from the BSF to the general fund — have reduced the ability of the BSF to serve its purpose: to smooth revenues over an economic cycle. Second, the Legislature has used BSF monies for purposes — to pay for the alternative fuels program and to renovate the Arizona State Hospital —other than the intent of the BSF. (House Concurrent Resolution 2037 in 2012 proposed the use of the BSF for natural disasters without supplementing its funding.) Third, the Legislature has rarely followed the formula regarding the amount to transfer to or from the fund. Transfers could be made automatic rather than subject to legislative action.

The functioning of the BSF would be more protected if it was specified in the Arizona Constitution instead of in statute. If included in the Constitution, it would be much more difficult for the Legislature to change the cap, alter the formula, use BSF monies for other than the stated purpose, or modify the amounts to be transferred to and from the BSF. Thus, the BSF would

largely be insulated from political pressures. In 11 states, the rainy-day fund is included in the state constitution.

In addition, one or more contingency funds could be created to handle fiscal emergencies other than the reduction in revenue due to the economic cycle. In addition to natural disasters, such a contingency fund could be used if a law, such as alternative fuels, had an unexpected fiscal impact or if a court ordered the state to spend more for a certain public program or ordered the state to refund certain revenues (as has occurred in the past).

Charney has recommended both that a separate contingency fund designed to handle financial emergencies other than those caused by an economic downturn be established and that the operation of the BSF be placed in the state's constitution to ensure that the fund operates as intended.

Budget Stabilization Fund Formula

The operation of the BSF that was specified in the original legislation was based on an examination of revenue flows and economic growth during prior economic cycles in Arizona. The 15 percent cap was based on the needs in moderate recessions — the legislation was not designed to provide adequate funding in a more severe recession. Reducing the limit by more than half has been a major, but not sole, reason why the BSF has been depleted in each of the recessions since its creation, long before the state's need for supplementary revenue ended.

In addition to the reduction in the cap to 7 percent, the change to the formula specifying that growth must be less than 2 percent before a transfer to the general fund can be made reduces the amount of funds available for transfer to the general fund. However, concern has also been expressed that even without these legislative changes, the BSF balance generally will not reach 15 percent before an economic recession prompts the transfer of BSF monies to the general fund. Thus, a full review of the operation of the BSF is in order. Since the initial analysis was performed in 1990, an additional 22 years of data are available.

In order to provide guidance on the needed size of the BSF and the calculation of transfers to and from the BSF, simulations of the functioning of the BSF have been made using actual data for general fund revenue and economic growth. Consistent revenue data from the JLBC are available for FYs 1971 through 2011. This 41-year period includes four complete economic cycles, plus a few additional years at both the beginning and end of the time series.

The economic time series must be available at least back to the mid-1960s because of the use of the long-term average growth rate in the BSF formula. Few economic series extend back that far. The existing measure of personal income less transfer payments is considered to be the best time series available for such a long period. While an employment time series extends back this far, employment is a poor candidate for this purpose since it is measured in people rather than dollars and because it is not adjusted for the number of hours worked or the wage earned.

Original Legislation

The first step of the analysis was to simulate the operation of the BSF as defined in the original legislation as if the BSF had been in place back to the early 1970s. Because of the severity of the

mid-1970s recession — the formula calls for a transfer from the BSF to the general fund of more than 15 percent over two years — the BSF would have been depleted in FY 1976, which is used as the starting point of the simulation. (Because it is not possible to know what the BSF balance would have been in FY 1971, it is not possible to state how large the shortfall of BSF monies would have been in the mid-1970s.)

During the economic expansion of the late 1970s, the balance in the BSF would have grown to 12.4 percent. This would have been more than sufficient for the recommended transfers back to the general fund during the early 1980s recession (see Table 1). However, relatively little would have been added to the BSF during the weak 1980s economic expansion, with the balance in the fund rising from 4.6 percent at the beginning of the expansion to a peak of 10.6 percent. This would have been insufficient to handle the needs of the long downturn that lasted from the late 1980s through the early 1990s — hardly any of the recommended transfers to the general fund in FYs 1992 and 1993 could have been made.

The strong and long economic expansion of the 1990s would have replenished the BSF, with the balance reaching 15 percent in FY 1999 (had the cap not been applied, the balance would have reached 16.7 percent). During the early 2000s recession, the balance would have dropped to 2.5 percent (the lowest balance would have been 4.2 percent had the 15 percent cap not been applied).

Despite starting the mid-2000s expansion with a positive balance, the BSF would have reached only a 7.2 percent balance in FY 2007 (the balance would have reached 8.5 percent had the 15 percent cap not been applied in the late 1990s). This balance would have been substantially insufficient to meet the needs of the deep and long recession during the late 2000s. The BSF balance would have dropped to zero in FY 2010 before $620 million of the recommended transfer could have been made. No money would have been available for the recommended FY 2011 transfer to the general fund.

Thus, the original legislation would have resulted in an inadequate balance in the BSF, regardless of whether a cap was applied, in three of the last five recessions. That is, the original formula did not recommend that enough money be placed in the BSF during years of strong economic growth to meet the needs in an average recession.

Existing Legislation

The second simulation was based on the existing legislation being applied to the entire period since FY 1971. It differs from the first simulation in two ways:

- Economic growth must be less than 2 percent for a transfer to be made from the BSF to the general fund.
- A 7 percent cap is applied instead of a 15 percent cap.

As in the first simulation, the BSF would have been depleted in FY 1976 given the 7 percent cap and the recommendation of an 11.4 percent transfer to the general fund. The balance would have grown to 7 percent in FY 1979 and remained there until the formula recommended a transfer to the general fund in FY 1983. The balance at the beginning of FY 1983 and the interest earned during that year would have been just enough to cover the recommended transfer (see Table 2).

TABLE 1
SIMULATION OF THE BUDGET STABILIZATION FUND
USING THE ORIGINAL LEGISLATION

	Transfer*		Ending Balance**	
Fiscal Year	**Millions**	**Percent**	**Millions**	**Percent**
1976	$-261.5	-11.4%	$0.0	0.0%
1977	30.1	1.3	30.1	1.2
1978	41.2	1.6	71.3	2.6
1979	139.7	5.2	212.4	7.2
1980	118.2	4.0	339.6	11.1
1981	5.8	0.2	363.4	12.4
1982	-33.1	-1.1	356.8	12.0
1983	-213.9	-7.2	155.5	5.3
1984	-9.6	-0.3	156.8	4.6
1985	136.8	4.0	302.7	7.8
1986	60.6	1.6	379.2	9.4
1987	51.0	1.3	444.7	10.6
1988	-29.7	-0.7	431.8	10.1
1989	-69.5	-1.6	384.0	8.4
1990	-174.5	-3.8	228.5	4.7
1991	-230.5	-4.8	5.2	0.1
1992	-136.1	-2.7	0.0	0.0
1993	-16.2	-0.3	0.0	0.0
1994	120.1	2.2	120.1	2.1
1995	300.1	5.2	424.1	6.9
1996	189.6	3.1	628.7	10.0
1997	157.9	2.5	808.7	12.2
1998	125.3	1.9	967.2	14.1
1999	209.5	3.1	1,087.2	15.0
2000	-143.7	-2.0	985.3	13.0
2001	49.6	0.7	1,067.8	14.1
2002	-355.9	-4.7	716.8	10.3
2003	-331.4	-4.8	382.0	5.5
2004	-189.4	-2.7	187.6	2.5
2005	107.8	1.4	293.6	3.3
2006	226.8	2.6	522.5	5.1
2007	208.1	2.0	741.8	7.2
2008	-172.2	-1.7	579.6	6.4
2009	-347.2	-3.8	225.1	3.2
2010	-844.6	-11.9	0.0	0.0
2011	-71.6	-1.1	0.0	0.0

* The transfer is calculated as the difference in the prior calendar year's growth rate from the seven-year average in personal income less transfer payments, multiplied by the prior fiscal year's ongoing general fund revenue. All figures are adjusted for inflation. A positive figure indicates a transfer from the general fund to the budget stabilization fund; a negative reflects a transfer from the BSF to the general fund.

** The ending balance is calculated as the sum of the prior year's ending balance, plus the transfer, plus interest earned. Interest is based on the fiscal year average federal funds rate, adjusted for inflation. The percentage is based on the revenue received in the current fiscal year.

Source: Calculated from Arizona Joint Legislative Budget Committee (ongoing revenue), the U.S. Department of Commerce, Bureau of Economic Analysis (personal income less transfer payments and the GDP implicit price deflator), and the Federal Reserve Bank (interest rates).

TABLE 2
SIMULATION OF THE BUDGET STABILIZATION FUND
USING THE EXISTING LEGISLATION

	Transfer*		Ending Balance**	
Fiscal Year	**Millions**	**Percent**	**Millions**	**Percent**
1976	$-261.5	-11.4%	$0.0	0.0%
1977	30.1	1.3	30.1	1.2
1978	41.2	1.6	71.3	2.6
1979	139.7	5.2	207.0	7.0
1980	118.2	4.0	214.9	7.0
1981	5.8	0.2	205.9	7.0
1982	0.0	0.0	207.9	7.0
1983	-213.9	-7.2	1.3	0.0
1984	0.0	0.0	1.4	0.0
1985	136.8	4.0	138.3	3.6
1986	60.6	1.6	206.2	5.1
1987	51.0	1.3	265.1	6.3
1988	0.0	0.0	275.1	6.4
1989	0.0	0.0	289.0	6.3
1990	0.0	0.0	303.0	6.3
1991	-230.5	-4.8	82.3	1.6
1992	-136.1	-2.7	0.0	0.0
1993	0.0	0.0	0.0	0.0
1994	120.1	2.2	120.1	2.1
1995	300.1	5.2	424.1	6.9
1996	189.6	3.1	441.9	7.0
1997	157.9	2.5	465.2	7.0
1998	125.3	1.9	479.3	7.0
1999	209.5	3.1	507.4	7.0
2000	0.0	0.0	526.9	7.0
2001	49.6	0.7	531.2	7.0
2002	-355.9	-4.7	177.7	2.6
2003	-331.4	-4.8	0.0	0.0
2004	0.0	0.0	0.0	0.0
2005	107.8	1.4	107.8	1.2
2006	226.8	2.6	335.3	3.3
2007	208.1	2.0	550.6	5.4
2008	0.0	0.0	558.0	6.1
2009	-347.2	-3.8	203.7	2.9
2010	-844.6	-11.9	0.0	0.0
2011	-71.6	-1.1	0.0	0.0

* The transfer is calculated as the difference in the prior calendar year's growth rate from the seven-year average in personal income less transfer payments, multiplied by the prior fiscal year's ongoing general fund revenue. All figures are adjusted for inflation. A positive figure indicates a transfer from the general fund to the budget stabilization fund; a negative reflects a transfer from the BSF to the general fund.

** The ending balance is calculated as the sum of the prior year's ending balance, plus the transfer, plus interest earned. Interest is based on the fiscal year average federal funds rate, adjusted for inflation. The percentage is based on the revenue received in the current fiscal year.

Source: Calculated from Arizona Joint Legislative Budget Committee (ongoing revenue), the U.S. Department of Commerce, Bureau of Economic Analysis (personal income less transfer payments and the GDP implicit price deflator), and the Federal Reserve Bank (interest rates).

During the relatively weak expansion of the 1980s, the BSF balance would not have reached 7 percent. Though the recommended transfers from the BSF to the general fund during the late 1980s-early 1990s are considerably lower in the second than in the first simulation, the BSF still would have been depleted in FY 1992 before all of the recommended transfer was made.

During the 1990s expansion, the BSF balance would have reached 7 percent in FY 1996 and stayed at that level through FY 2001. This balance would have been inadequate to handle the recommended transfers to the general fund in FYs 2002 and 2003.

As in the 1980s, the balance in the BSF would not have reached 7 percent during the mid-2000s expansion. More than $700 million in recommended transfers to the general fund during FYs 2010 and 2011 could not have been made.

The requirement that economic growth be less than 2 percent for a transfer to be made from the BSF to the general fund would have reduced transfers in each of the last five recessions. In two of those recessions, the amount blocked from being transferred would have amounted to more than 5 percent of the general fund budget. For example, in FY 2008, since the economic growth rate slightly exceeded 2 percent the formula called for no transfer to be made despite the deteriorating economy (the recession began in the middle of the fiscal year). In reality, the Legislature overrode the recommendation and transferred close to $500 million from the BSF to the general fund.

Even if the requirement that growth be less than 2 percent to make a transfer to the general fund had not been in place, the current 7 percent cap would have caused the BSF to be depleted in each of the last five recessions.

The recommended and available transfers from the BSF to the general fund during each of the last five economic recessions are summarized in Table 3. The transfers under the existing legislation are compared to those based on the original legislation. In each downturn, the recommended transfers are lower based on the existing legislation. Similarly, the amount available to transfer is less in each case using the existing legislation. The difference between the amount recommended under the original legislation and the amount available under the existing legislation are sizable in each of the last three recessions: $344 million (8.0 percent of general fund revenue) during the late 1980s-early 1990s downturn, $343 million (5.0 percent) during the early 2000s downturn, and $884 million (9.7 percent) in the recent recession.

Possible Modifications to Formula

The analysis so far illustrates that the modifications to the original legislation had the effect of reducing the amount of money available in the BSF for transfer to the general fund during recessions. Even under the original legislation, not enough money would be deposited in the BSF to handle the needs during the majority of the recessions.

In order to boost deposits to the BSF, the original formula could be modified in various ways:

- Long-term average growth could be calculated over a period other than seven years.
- The nature of the formula — the difference between the most recent year's economic growth and long-term average growth multiplied by revenue — could be modified.

TABLE 3
SIMULATED CUMULATIVE TRANSFER FROM THE BUDGET STABILIZATION FUND TO THE GENERAL FUND DURING RECESSIONS USING THE ORIGINAL AND EXISTING LEGISLATION

ORIGINAL LEGISLATION					EXISTING LEGISLATION				
Fiscal Years*	Recommended		Available		Fiscal Years*	Recommended		Available	
1975-76	$364	15.9%	$na	na%	1976	$261	11.4%	$na	na%
1982-84	257	8.7	414	13.9	1983	214	7.2	208	7.0
1988-93	656	15.3	509	11.8	1991-92	367	8.5	312	7.3
2002-04	877	12.7	1,065	15.4	2002-03	687	9.9	534	7.7
2008-11	1,435	15.7	744	8.2	2009-11	1,263	13.9	551	6.0

Notes: Dollars are in millions. For consistency, all of the percentages are calculated relative to general fund revenue in the first year in which a transfer is recommended according to the original legislation.

* Fiscal years in which the formula recommends a transfer to the general fund

Source: Calculated from Arizona Joint Legislative Budget Committee (ongoing revenue), the U.S. Department of Commerce, Bureau of Economic Analysis (personal income less transfer payments and the GDP implicit price deflator), and the Federal Reserve Bank (interest rates).

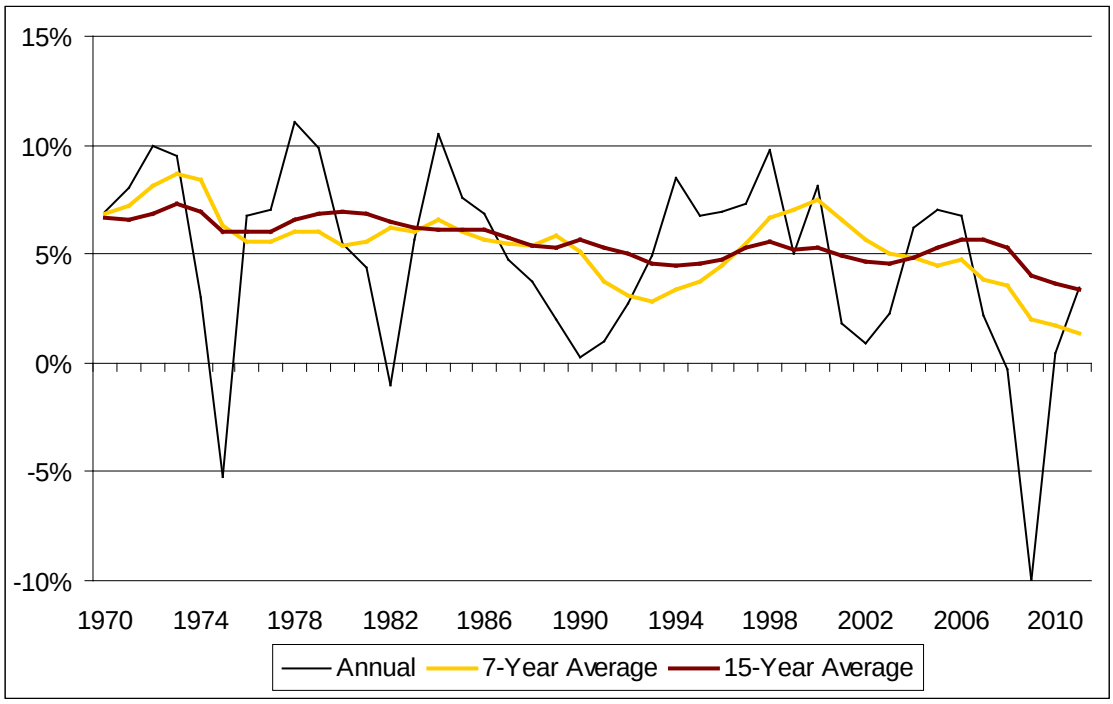
- A different economic indicator could be used. For example, Charney suggested that a per capita measure be used.

Since most of the recent economic cycles have lasted more than seven years, averaging economic growth over seven years is too short a time span. Conceptually, it would be better if the long-term average was calculated based on complete economic cycles rather than an arbitrary number of years. Since even average economic growth varies from one cycle to another, average economic growth should be calculated over more than one economic cycle. However, economic cycles in Arizona are not officially dated, each economic cycle has a different length, and the length of the recessionary phase varies as a percentage of the total cycle length. Thus, it is impractical to put into law that the average growth rate is to be calculated on the basis of economic cycles.

Instead, the length of two consecutive economic cycles can be used as a guide to determining the number of years to use for the long-term average. The last two economic cycles lasted a total of 20 years, but historically cycles were shorter in length, with two consecutive cycles sometimes lasting less than 10 years. As a compromise, a 15-year average was tested.

Annual economic growth is compared to the seven- and 15-year averages in Chart 3. The seven-year average goes up and down considerably over the period of a few years and also demonstrates a downward trend. In particular, the severity and length of the last recession caused the seven-year average to drop considerably. Such a widely varying average distorts the calculation of the amounts to transfer into and out of the BSF. The difference between annual economic growth and the seven-year average was less during the recessionary years than if the seven-year average that was present during the expansionary phase of the cycle had been used.

CHART 3
PERCENT CHANGE IN INFLATION-ADJUSTED PERSONAL INCOME LESS TRANSFER PAYMENTS



Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis data.

The formula therefore minimized the severity of the recession and understated the amount to transfer from the BSF to the general fund.

While the 15-year average reduces the cyclicality of the long-term average, it does not eliminate it. Thus, somewhat lengthening the period over which the average is calculated will not eliminate the problem. Instead, the use of any rolling average will distort the calculations of the amounts to transfer. Since average economic growth also displays a downward trend, calculating an average over a much longer period is also not appropriate. Over a long time span, the downward trend in percentage economic growth simply reflects the mathematical relationship that as a base becomes larger, the same amount of change results in a declining percentage rate. In the case of aggregate economic growth in Arizona, this mathematical relationship is being captured in declines over time in percentage population growth and in percentage per capita economic growth. This suggests that using per capita economic growth instead of aggregate growth in the formula will reduce the magnitude of the problem.

Thus, a third simulation was run in which the formula uses the annual percentage change in real *per capita* personal income less transfer payments. The annual change in each year is compared to the 41-year (1971 through 2011) average of 1.3 percent growth. In addition, no cap is applied.

To be consistent with the first two simulations, this simulation was begun with the assumption that the BSF balance in FY 1976 was zero. Using this starting point for the analysis suggests that

the formula either deposits too much money into the BSF during expansions or withdraws too little during recessions — the balance in the BSF never drops below 8 percent after FY 1978 and exceeds 20 percent in some years.

However, a different conclusion is reached if the starting point for the analysis is changed. If the provisions of the modified formula had been implemented at the time of the original legislation in 1990, the balance in the BSF would have peaked at 18 percent at the end of the 1990s expansion and dropped to near 1 percent at the end of FY 2011. (The annual figures are shown in Table 4.) Had these provisions gone into effect at the end of the early 1980s recession, the BSF would have fallen $22 million short of the recommended transfers at the end of the late 1980s-early 1990s down cycle; its balance would have dropped to just under 1 percent in FY 2011. Thus, the provisions of the modified formula appear to be reasonable in most circumstances.

TABLE 4
SIMULATION OF THE BUDGET STABILIZATION FUND USING A MODIFIED FORMULA

	Transfer*		Ending Balance**	
Fiscal Year	**Millions**	**Percent**	**Millions**	**Percent**
1994	$-10.6	-0.2%	$0.0	0.0%
1995	150.9	2.6	150.9	2.4
1996	60.1	1.0	216.4	3.4
1997	127.4	2.0	351.4	5.3
1998	174.1	2.6	539.9	7.9
1999	353.3	5.2	913.2	12.6
2000	58.9	0.8	1,007.3	13.3
2001	301.5	4.0	1,342.4	17.7
2002	-125.4	-1.7	1,223.1	17.7
2003	-188.9	-2.7	1,028.5	14.8
2004	-80.8	-1.2	934.2	12.3
2005	173.4	2.3	1,098.7	12.4
2006	203.1	2.3	1,310.2	12.9
2007	210.7	2.1	1,549.0	15.1
2008	-146.6	-1.4	1,423.3	15.6
2009	-306.5	-3.4	1,098.7	15.5
2010	-868.3	-12.2	224.6	3.5
2011	-122.2	-1.9	98.8	1.4

* The transfer is calculated as the difference in the prior calendar year's growth rate in per capita personal income less transfer payments from the long-term average of 1.3 percent, multiplied by the prior fiscal year's ongoing general fund revenue. All figures are adjusted for inflation. A positive figure indicates a transfer from the general fund to the budget stabilization fund; a negative reflects a transfer from the BSF to the general fund.

** The ending balance is calculated as the sum of the prior year's ending balance, plus the transfer, plus interest earned. Interest is based on the fiscal year average federal funds rate, adjusted for inflation. The percentage is based on the revenue received in the current fiscal year.

Source: Calculated from Arizona Joint Legislative Budget Committee (ongoing revenue), the U.S. Department of Commerce, Bureau of Economic Analysis (personal income less transfer payments and the GDP implicit price deflator), and the Federal Reserve Bank (interest rates).

The recommended transfers from the BSF to the general fund using the modified formula would have been lower than the recommendations of the original formula in four of the last five recessions (see Table 5). However, the recommended transfer would have been the same in the last recession. A better comparison is to the funds actually available under the original legislation. Compared to the amount available under the original legislation, the recommended cumulative transfer using the modified formula would have equaled that of the late 1980s-early 1990s downturn and would have been nearly twice as high in the last recession.

The alternatives addressed in this subsection do not resolve the issue raised by Charney that timeliness is compromised by the use of annual data on personal income less transfer payments. Timeliness could be improved by using quarterly data; for example, the economic growth rate could be based on the one-year change through the fourth quarter of the calendar year rather than based on the annual average. The use of quarterly data, however, would introduce other issues: (1) When first released, the quarterly data are preliminary and subject to considerable revision; (2) a quarterly series always is more erratic than an annual series; (3) population would have to be estimated quarterly in order to use a per capita measure.

Budget Stabilization Fund Cap

In the third simulation using the modified formula, no cap was applied. The simulation indicates that a 15 percent cap would be appropriate if the intent is the same as that expressed when the BSF was initially created: for the BSF to have adequate funding for most, but not severe, economic downturns. A 20 percent cap likely would be high enough to ensure that the BSF would have adequate funds in all recessions (but not in a depression).

The design of the modified formula and the application of a 15 percent cap is based on the original intent of the BSF to smooth out revenues. In contrast, Charney proposed that the BSF

TABLE 5
SIMULATED CUMULATIVE TRANSFER FROM THE BUDGET STABILIZATION FUND TO THE GENERAL FUND DURING RECESSIONS USING THE ORIGINAL LEGISLATION AND A MODIFIED FORMULA

ORIGINAL LEGISLATION					MODIFIED FORMULA				
Fiscal Years*	Recommended		Available		Fiscal Years*	Recommended		Available	
1975-76	$364	15.9%	$na	na%	1975-76	$265	11.6%	$na	na%
1982-84	257	8.7	414	13.9	1983	151	5.2	481	16.2
1988-93	656	15.3	509	11.8	1988-94	511	11.9	988	23.0
2002-04	877	12.7	1,065	15.4	2002-04	395	5.7	1,932	27.9
2008-11	1,435	15.7	744	8.2	2008-11	1,444	15.8	2,145	23.5

Notes: Dollars are in millions. For consistency, all of the percentages are calculated relative to general fund revenue in the first year in which a transfer is recommended according to the original legislation.

* Fiscal years in which the formula recommends a transfer to the general fund

Source: Calculated from Arizona Joint Legislative Budget Committee (ongoing revenue), the U.S. Department of Commerce, Bureau of Economic Analysis (personal income less transfer payments, population, and the GDP implicit price deflator), and the Federal Reserve Bank (interest rates).

provide adequate funding to not only offset the decline in revenue but also to handle the countercyclical increase in demand for some public services during recessions. In this situation, not only would the cap need to be considerably higher than 15 percent — Charney proposed at least 30 percent — but the formula used in the third simulation would have to be modified so that more money was deposited into the BSF during economic expansions so that more could be withdrawn from the BSF during recessions.

Even if the countercyclical increase in demand for public services is not considered, the current cap of 7 percent is far too low to serve the purpose of the BSF. This was demonstrated in each of the three simulations — in most recessions, the BSF would have been depleted before the need for supplementary revenue ended. Seven states have no cap on their rainy-day fund and 20 others have a cap larger than 7 percent. Moreover, most of these states do not have an economy or revenue flows as cyclical as in Arizona.

RECOMMENDATIONS

1. **Change the formula so that adequate monies are transferred into the BSF during economic expansions and that adequate transfers to the general fund are made during economic recessions**.

The proposed formula is different from the existing formula in three ways:

- The economic measure used is per capita personal income less transfer payments rather than aggregate personal income less transfer payments.
- Instead of a rolling seven-year average, a constant figure is used for economic growth, based on the 41-year average.
- The requirement that economic growth be less than a certain rate is removed. (This requirement should be removed even if the other aspects of the formula are not modified.)

2. **Raise the BSF cap**.

The current limit of 7 percent should be raised to at least 15 percent. This higher cap should be applied regardless of whether the formula is adjusted. Analysts, both conservative and liberal, have indicated that increasing the balance in the BSF is one of the few most important improvements to be made to the state's fiscal system. If the BSF has a substantial balance when an economic downturn begins, the state will be better able to sustain spending from its general fund. This in turn mitigates the severity of the recession.

While it is impossible to know with certainty what policy actions might, or might not, have taken place if a higher cap was in place during the last two decades, one can contend that spending increases and tax cuts based on a temporary surplus would have been less likely and/or the magnitudes would have been smaller. In the last economic cycle, the BSF cap of 7 percent was reached in FY 2007, a year with a sizable surplus of general fund revenue. Had the cap been higher, more money might have been deposited into the BSF instead of appropriating dollars for programs that could not be afforded except at the cyclical peak, such as all-day kindergarten. Similarly, the magnitude of the tax reductions that were implemented in FYs 2007 and 2008 might have been less. Thus, a higher cap may help put fiscal discipline in place, especially during the expansionary phase of the economic cycle.

3. **Place the authority and functioning of the BSF in the Arizona Constitution**.
This will help protect the BSF from politically induced amendments and make it more difficult to use the funds for other than the stated purpose. Transfers to and from the fund will be automatic, based on the formula. The Legislature will retain considerable discretion over revenues and expenditures.

4. **Create one or more contingency funds to use for fiscal emergencies other than cyclical reductions in revenue**.
The BSF will be more effective if dedicated to a particular purpose. Other similar funds could be set up for other purposes.

5. **Pass a requirement that no increase in public spending can be made without the creation of an adequate funding source and that no reduction to revenues can be made without a commensurate reduction in spending**.
Such a requirement, in conjunction with mandatory transfers to the BSF when surplus revenue exists, would preclude the practice of making permanent revenue and expenditure decisions based on a short-term revenue surplus.

6. **Change the general fund's revenue structure so that it is less dependent on highly cyclical revenue sources**.
More generally, analysts agree that the revenue system should be broadly based, with low tax rates applied to each source. Such a structure will produce benefits other than reducing the cyclicality of revenues.