ARIZONA STATE TREASURER'S OFFICE

STATE OF ARIZONA TREASURER'S OFFICE STRESS TEST RESULTS OF OPERATING CASH FLOW AND ENDOWMENT DISTRIBUTIONS

Kimberly Yee, Arizona State Treasurer

January 22, 2021

EXECUTIVE SUMMARY

This is the Arizona Treasurer's Office third annual report on stress testing the State of Arizona's operating cash balances and Permanent Land Endowment Trust Fund (PLETF) distributions.

The purpose of the annual stress tests is to provide policymakers a view on how budgeting decisions today can affect taxpayers tomorrow. Cash flow, whether for a home, business or government is critical. However, unlike a home or business, once the Arizona Legislature and Governor approve an annual budget, state agencies are authorized to spend money, regardless of cash flow.

Despite the economic effects of the Covid-19 pandemic the state's budget outlook is positive, tax revenues are growing, and the state's operating cash balance remains strong. For the first six months of FY 2021, operating cash is up 44% year over year to an average of $3.2 billion, or $981 million more than the first six months of FY 2020. This does not include federal CARES funds received in April due to the pandemic.

During the Great Financial Crisis (GFC) from 2007 to 2009, the state eventually ran out of cash to pay its bills. Despite repeated warnings from the Arizona State Treasurer's Office (ASTO) in 2007, 2008 and 2009, the state kept spending money without regard to its income. By fiscal year 2010 (July 1, 2009 to June 30, 2010) the state's operating cash was in the red for 305 days. If not for a $700 Million daily credit line negotiated by the ASTO in conjunction with the State Loan Commission, along with other emergency internal borrowing from state agency funds, the state would have failed to make payments on their obligations. (The loan commission, chaired by the State Treasurer, includes the Governor and the Director of the Department of Administration).

Furthermore, distributions from the Permanent Land Endowment Trust Fund (endowment) were zero in FY 2010 due to the methodology of the constitutional distribution formula governing payouts.

The annual ASTO stress tests estimate how long the state's cash balance would remain positive during a future economic downturn and whether there would be a decrease in endowment distributions. The purpose of our "what if" analysis is to assist policymakers with more information as they budget and to help the state prepare for future economic downturns.

General Fund Cash Flow

Arizona is positioned to withstand recessions on par with the 1991 and 2001 recessions. However, the state is not positioned to withstand a recession like the GFC. Under a repeat of the GFC, the state would begin to feel cash flow stress within 16 months. However, the $930 million K-12 rollover paid each July remains a problem that needs addressing. (See DEFINITIONS for information on the 'rollover').

Endowment Cash Flow

For endowment distributions, a repeat of any of the previous large stock market downturns since the 1980s would have ***minimal impact*** on distributions. With four more years of distributions under the existing Proposition 123 formula, only one year would see a slight year-over-year decrease in distributions based on the stress tests.

Finally, it is worth noting what a difference a year makes. When this report was first conducted in the Fall of 2018, equity markets were declining, the Federal Reserve was raising interest rates and a portion of the United States Treasury yield curve had begun to invert, traditionally seen as a sign that slower economic growth is on the horizon within 24 months.

Last year at this time, equity markets were hitting record highs, the Federal Reserve had reversed course reducing interest rates and the yield curve, which inverted during 2019, had normalized with longer dated notes yielding more than shorter term notes. Further, the state's operating cash balances were at historic highs and reached its highest level ever on June 25, 2019 of $3.75 billion.

Due to the Covid-19 pandemic, the Federal Reserve slashed interest rates to zero in March 2020, equity markets sold off more than 30%, and most of the country faced government ordered shutdowns not seen since the 1918 Spanish Flu pandemic. Yet, by the close of 2020, equity markets were back at record highs, and the state's operating cash balances had reached new highs of $4.6 billion.

This underscores the lesson that financial conditions change quickly, and policymakers need to be prepared to change direction as well when it comes to revenue and expenditure forecasts.

More than a dozen years have passed since the GFC which resulted in the State of Arizona running out of operating cash and having to borrow as much as $958 Million each day to pay teachers, public safety workers, health care providers and general government employees and operations. It was the first time since the mid 1950's that the ASTO had to issue Treasurer Warrant Notes (TWNS), a short-term IOU, to cover the checks that the state issued to pay salaries, vendors, and state aid to schools and local governments. This short-term debt was separate from other debt issued to fund operations during the GFC.

The operating cash balance consists of General Fund tax revenues, tax revenues that are not allowed to earn interest, and tax revenues allowed to earn interest but not invested on that day due to timing of notifications from state agencies to the ASTO. The operating cash is invested daily by the Treasurer's office in a variety of pooled funds. Interest earned on the operating balance is credited to the General Fund. State law requires the ASTO to pay all warrants issued by the Department of Administration. General Fund warrants can be paid from all operating monies and when no operating cash exists, then TWNS are issued to provide liquidity.

Records exist back to 1991 of the monthly average operating balance and to January 1996 of the daily operating balance. This historical data provides a record of the state's operating cash flows over several economic cycles, including three nationally-recognized recessions. In each of those recessions, operating cash declined on a year over year basis and went negative during the GFC. The cycles of these operating cash declines range from 18-42 consecutive months. Each cycle corresponded with the Arizona Legislature having to cut budgets, reduce spending, raise revenues, or enact accounting changes that had the effect of papering over a deficit on a "cash basis", while not helping to resolve the negative impacts of the state's operating cash balance. The three other periods that operating cash declined on a year over year basis were not recessionary but corresponded with budget pressures at the State Capitol. These three periods ranged from 9-20 months in duration. Thus, we can use the health of the operating cash flow balances (i.e. the monthly year over year change) as a proxy indicator of the overall health of the state's General Fund budget.

Currently, the state's operating cash balances are growing at a healthy rate and achieved record highs in December 2020 of $4.6 billion. (These amounts do not include unspent federal CARES funds.) The ASTO monitors operating cash flow daily, updating current year forecasts in real time to spot any significant variances that would require notification to policy makers.

I. Methodology of Tests

To stress cash flows, we applied a "what-if" scenario by calculating the percentage monthly declines in six prior recessionary periods of consecutive negative months, as seen in Exhibit 1, to the October 2020 average monthly balance of $3.45 Billion. Applying this methodology

provides a variety of stress cases of cash flow over the previous three decades to predict drawdowns in operating balances. If projected operating balances fall below established risk tolerances, the state should immediately take steps to prevent a future negative operating balance. Including cash flow forecasts into the strategic budget planning process and day-to-day operations would be necessary steps to avoid running out of cash in the future.

Drawdown Period	Time Frame	Total Months	Beginning Average Balance (previous month)	Ending Average Balance	Lowest Average Balance
1991 Recession	Jul 1991 - Dec 1992	18	$344 Million	$182 Million	$116 Million
Y2K slow down	Apr 1999 - Dec 1999	9	$1,482 Million	$1,374 Million	$1,207 Million
2001 Recession	Mar 2001 - May 2003	27	$1,651 Million	$841 Million	$792 Million
Great Financial Crisis	Jan 2007 - Jun 2010	42	$2,181 Million	$450 Million	-$733 Million
2014-2015 slowdown	Apr 2014 - Jul 2015	16	$2,107 Million	$1,795 Million	$1,369 Million
2016-2018 slowdown	Aug 2016 - Mar 2018	20	$2,012 Million	$1,937 Million	$1,303 Million

Exhibit 1

II. Definition of Stress

Stress on operating cash varies throughout the year due to the seasonality of payments made by the state. The first sign of stress occurs if the average monthly operating cash balance falls below $1 Billion. This is because each month, the state makes payments that approach $1 Billion on the fifth business day of each month to various vendors, with Medicaid payments being the largest on that day. Further, if operating cash does not maintain a balance of $2 Billion or more on average at the beginning of February each year, then cash flow stress will develop as state income tax refunds begin to be paid that month, and then five months later the K-12 education rollover must be paid along with prepayment of public safety pension contributions in early July.

III. Operating Cash Flow Results

Only in one of six scenarios does the state operating cash turn negative and not survive a downturn and that is a repeat of the 2007-2009 recession. A repeat of that downturn, which saw 42 consecutive months of year over year negative monthly cash flow, would result in the state's operating cash reaching stress levels in 16 months when operating cash drops to $898 Million on average.

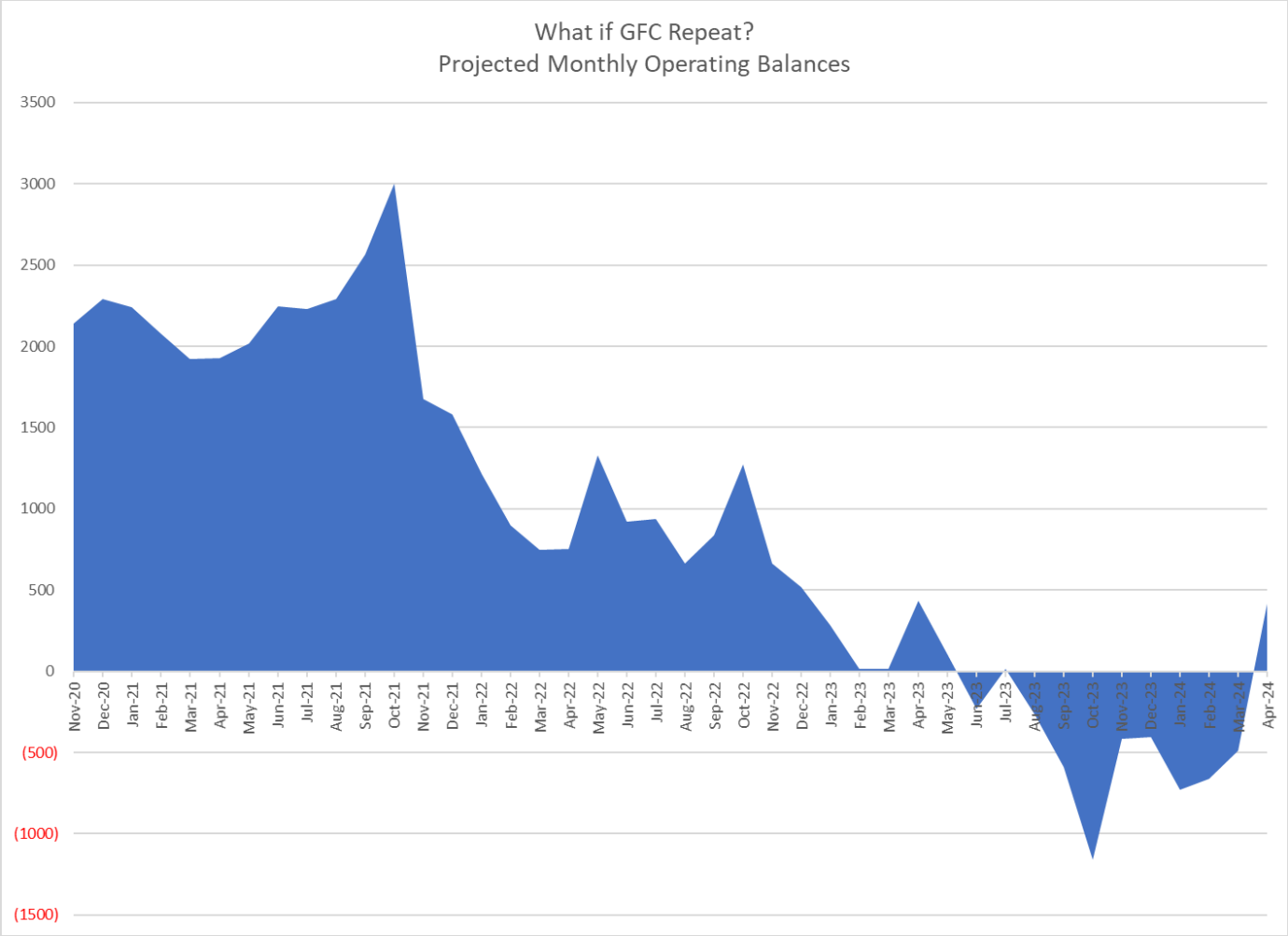
Severe stress would begin in 22 months with average balances dropping below $665 Million and the state running out of cash in 28 months. (Exhibit 2 below.) Using the state's current $964 million Budget Stabilization Fund (BSF) balance would delay negative cash flow by five months but would turn negative after the K-12 rollover was paid. (See DEFINITIONS for information on the BSF).

However, if the K-12 rollover did not exist, operating cash, while stressed, would only turn negative for one month under a repeat of the 42-month GFC scenario. This would give policymakers time to address structural spending gaps during a severe recession, potentially avoiding the severe stress on operating cash flow.

Under all other scenarios, our estimates indicate Arizona has enough operating funds to remain solvent when compared against all other historic drawdowns of operating cash that have occurred since 1990. This also assumes no disruption or reduction in federal funds or extended federal government shutdowns that delay payments to states during these times.

The smallest operating balance would occur under a repeat of the 1991 recession scenario with cash flow averaging $1.16 billion 16 months into that slowdown. With the current BSF balance of $963 million, there is the necessary cushion to drawdowns of operating cash. Reducing the K-12 rollover by at least a third would also ensure enough liquidity to endure the effects of an 18-month downturn in revenue as experienced in the 1990-1991-time frame.

The same caveats apply to a repeat of the 2001 recession scenario. Cash flow stress appears in 22 months when the average balance falls to $1.3 billion. As with the 1991 recession, the BSF balance combined with a paydown of the K-12 rollover provides enough liquidity for cash flow to withstand the 27 consecutive months in declining year over year operating cash balances.


What if GFC Repeat?
Projected Monthly Operating Balances
3500
3000
2500
2000
1500
1000
500
0
(500)
(1000)
(1500)
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
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Jun-23
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Mar-24
Apr-24

Exhibit 2

IV. Endowment Distributions Background

When Arizona became a state in 1912, the Federal Government deeded 10 million acres of land to be held in trust for 13 different governmental beneficiaries, the largest being K-12 public education. The land is held in trust for the beneficiaries and any income produced from the land is for the use of the beneficiaries. If any of the land is ever sold, the proceeds from the sale are deposited with the State Treasurer to be invested in perpetuity so that income will continue to be produced for the beneficiaries. The income distributed in any given years is controlled by a formula in the Arizona Constitution, which can only be changed by a vote of the public at a general election. After zero distributions in FY 2010, voters approved a flat 2.5% distribution formula at the ballot in 2012 and changed the formula again in 2016.

Currently, distributions are set at 6.9% of the average market value of the preceding five calendar years of the Endowment, paid out monthly. After FY 2025, distributions will be 2.5% of the five-calendar year rolling average market value in perpetuity.

V. Methodology of Endowment Tests

To stress test the 6.9% distributions, we applied the "what if" scenarios of previous stock market downturns to the market value of the endowment at the end of October 2020. We used the monthly total returns of the four current benchmarks the endowment is measured by to conduct the stress tests for the time periods selected. We began with the first negative month of what would have been declared the start of market downturns and applied those monthly returns to our ending balance of October 2020 through the end of calendar year 2027, a full two years after the current 6.9% distribution ends.

The chosen periods were the GFC, the 2000 Tech Bubble Crash, the 1987 October Black Monday crash and the early 1980s recession. We also modeled deposits from the Land Department as they occurred during the GFC to mirror the same type of economic activity and movement of cash flows in the analysis but adjusted for the higher 6.9% distributions now required by law. This is to demonstrate how the formula would perform if history repeated similar market downturns.

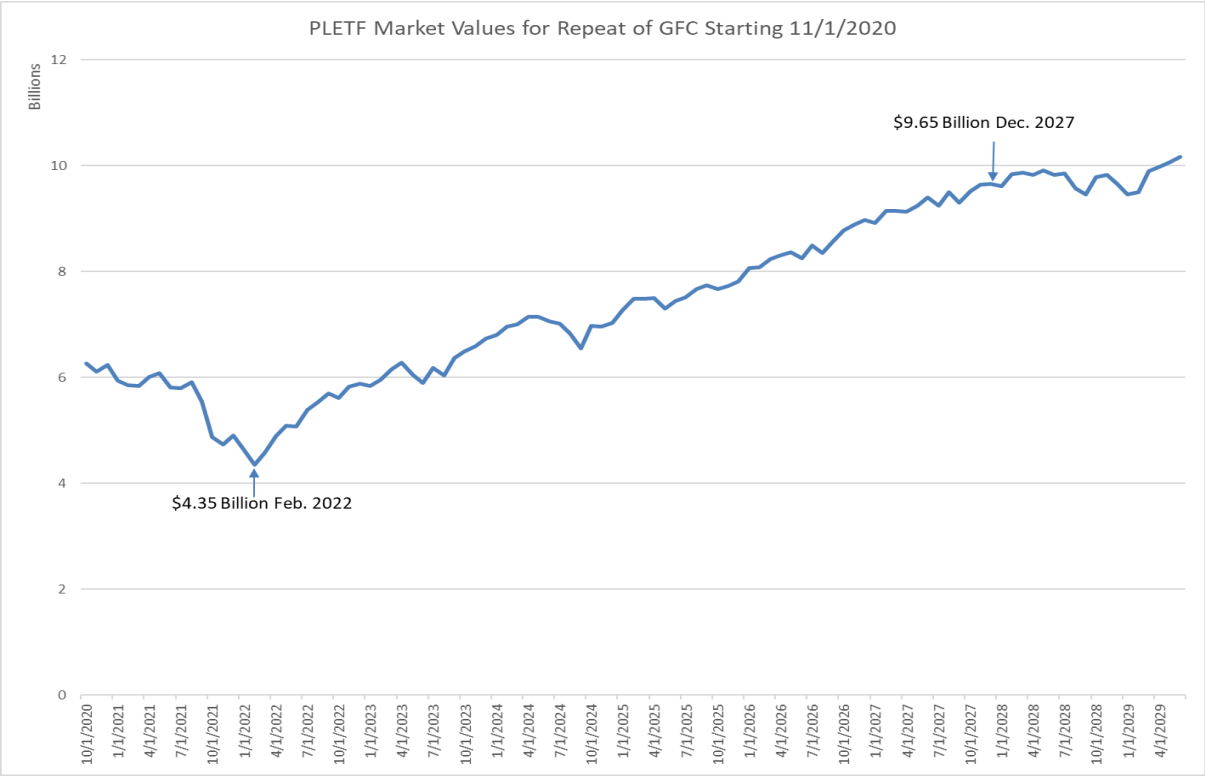
All results were based on macro level data of the combined endowment, and not the individual components of the 13 different beneficiaries. While K-12 Schools received about 87% of the land at statehood, they make up about 93% of the Endowment as more of their land has been sold since statehood on a percentage basis.

VI. Endowment Distribution Results

The results of the tests on the endowment found that the distributions perform well through the stressed periods. For example, if a repeat of the GFC occurred, monthly payouts between year two and three would only decline by about $480,109 a month from $33.7 Million in FY 2023 to $33.2 Million in FY 2024 before increasing again in FY 2025 to $33.6 Million. This compares to the $32.1 Million monthly distribution in FY 2021.

This projected performance might surprise some, but shouldn't, as the distribution formula is based on a percentage of the averaged market value for the preceding five years. This smooths out the shock of any stock market correction or bear market so that beneficiaries will not experience wild swings in the monthly income they receive from the endowment.

It should be noted that this doesn't mean the market value of the endowment doesn't decline in the market downturn. It does substantially. In the case of a repeat of the GFC the total market value of the endowment would decline to a projected low point of $4.35 Billion in February 2022 from the $6.26 Billion on October 31, 2020. It would then again reach $6.26 Billion by April 2023, while also paying out about $33 Million a month. It should be noted the market value of the endowment during the GFC also declined substantially and recovered from a high of $2.7 Billion in December 2007 to a low of $2.15 Billion in February 2009 before growing back above $2.7 Billion by February 2010.



The reason the total value of the endowment can recover quickly is due to the disciplined investment policy adopted by the Treasurer and the State Board of Investment as dictated by the Arizona Constitution. The investment policy has determined that the best method to invest for the endowment is investing only in United States companies via a passive index strategy for equities (60% allocation) and an actively managed fixed income bond portfolio (40% allocation). The Board also has adopted a market value rebalancing measure that sells equities when they reach 62.5%% of total market value of the Endowment or buy equities when the value of equities reaches below 57.5% of total market value of the combined Endowment. In 2020, this rebalancing trigger was reached eight times, allowing the Endowment to realize at least $380 million of investment gains in the first 11 months of the calendar year.

This traditional 60/40 portfolio has demonstrated to provide stable returns with reduced volatility when compared to large endowments and pension funds across the country that have migrated to strategies that contain illiquid alternative investments. One consequence of these alternative strategies is during downturns, when distributions are needed, these alternative investments are not able to be sold, forcing the remaining stocks and bonds in a portfolio to be sold to raise cash. This action can significantly reduce the value of a fund even further during times of stress. Further, during the GFC, many endowments saw historically non-correlated assets become highly correlated precisely at the time they had been intended to act as hedges against market volatility and offset risk and provide improved risk adjusted returns.

VII. Conclusion

Liquidity risk must be identified, measured, and monitored in a timely and comprehensive manner. Arizona was hit hard in the Great Financial Crisis of 2007-2010 and its state government was not prepared for the impact. Although there are still obstacles that would hinder Arizona, the state is better prepared for another severe recession and is well placed to weather milder recessions like what occurred in 1991 and 2001 than it had been in the past, at least when it comes to operating cash flow forecasts. The K-12 rollover continues to be an outstanding problem that needs to be addressed to better prepare for the next economic downturn.

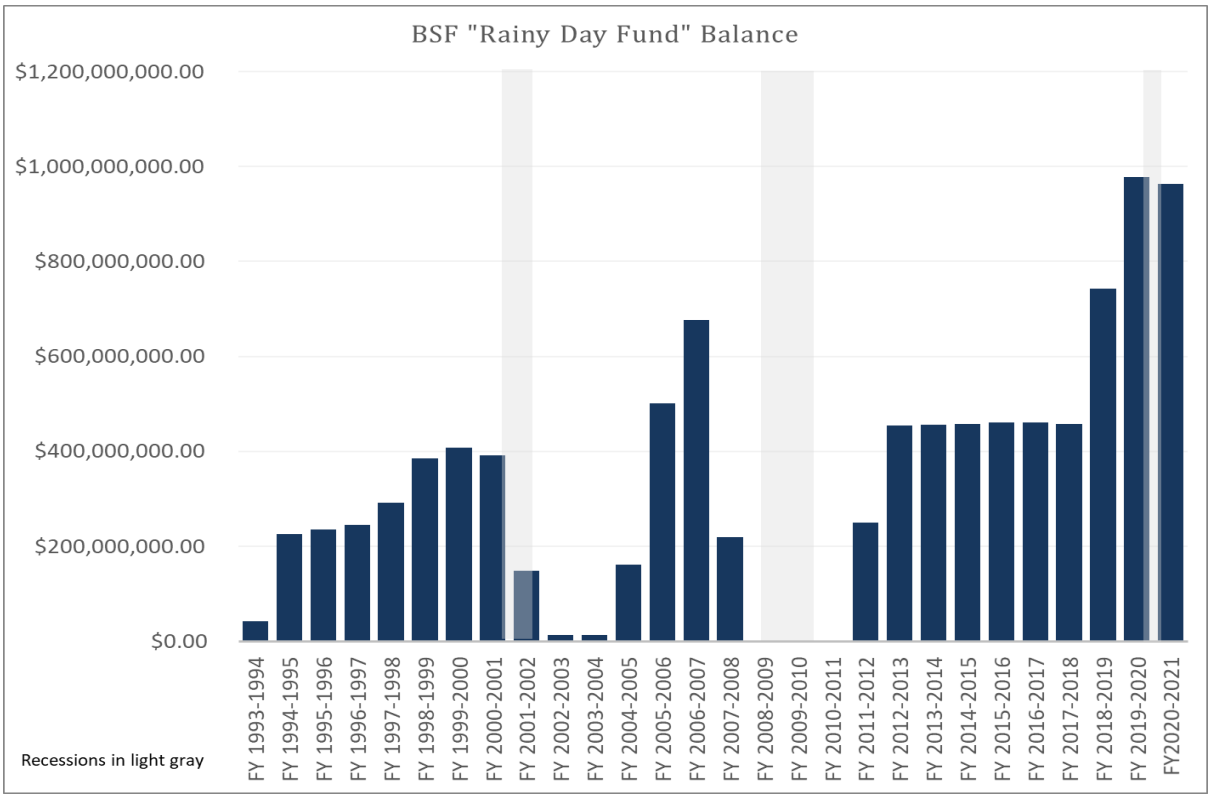
VIII. Definitions

WHAT IS THE K-12 ROLLOVER?

During the Great Financial Crisis (GFC) of 2007-2010, the state needed to take extraordinary measures to balance the budget. One such tool was to delay K-12 school appropriations payments. Instead of making the required appropriations payment for June 2008 in June 2008, the state delayed the $272 Million payment; pushing it into the next fiscal year beginning July 1. The state made the required July appropriations payment and carried the June payment as an outstanding liability to K-12 schools. The state took the same action again in June 2009 ($330 Million) and June 2010 ($350 Million); this tool became known as the "rollover." Beginning in fiscal year 2013, the rollover was eliminated for school districts with fewer than 600 students which drew down some of the liability. Currently, the three rollover payments total approximately $930 Million owed to K-12 schools and is scheduled to be reduced to $900 million in FY2022. The rollover applies only to district public schools; not charter public schools.

WHAT IS THE BUDGET STABILIZATION FUND (BSF)?

The Budget Stabilization Fund (BSF) for Arizona was enacted in 1990 (A.R.S. § 35-144). The fund is administered by the State Treasurer, who is responsible for transferring General Fund money into and out of the BSF as directed by the Legislature and Governor and as required by law. Under the statutory formula, a maximum of $1.1 Billion can be deposited for Fiscal Year 2021. The BSF is like an emergency savings account and is designed to set revenue aside during times of above-trend economic growth and to utilize this revenue during times of below-trend growth. The BSF is also known as the "Rainy Day Fund." When first enacted, the balance in the BSF was to be capped at 15% of general fund revenues and was later lowered to 5% then up to 7% and last year was increased to a 10% cap. See the graph below of the annual historical balance at the end of each fiscal year and the current balance.


BSF "Rainy Day Fund" Balance
$1,200,000,000.00
$1,000,000,000.00
$800,000,000.00
$600,000,000.00
$400,000,000.00
$200,000,000.00
$0.00
Recessions in light gray
FY 1993-1994
FY 1994-1995
FY 1995-1996
FY 1996-1997
FY 1997-1998
FY 1998-1999
FY 1999-2000
FY 2000-2001
FY 2001-2002
FY 2002-2003
FY 2003-2004
FY 2004-2005
FY 2005-2006
FY 2006-2007
FY 2007-2008
FY 2008-2009
FY 2009-2010
FY 2010-2011
FY 2011-2012
FY 2012-2013
FY 2013-2014
FY 2014-2015
FY 2015-2016
FY 2016-2017
FY 2017-2018
FY 2018-2019
FY 2019-2020
FY2020-2021

Appendices

Appendix A

Operating Balance Drawdowns July 1991- December 1992

Note all $ figures in millions

1991 Recession	Monthly Operating Balance	YOY Change	What If Scenario	Projected Monthly Balance
Jul-91	$236	-26.48%	Nov-20	$1,660
Aug-91	$259	-6.16%	Dec-20	$2,310
Sep-91	$232	-14.39%	Jan-21	$2,451
Oct-91	$168	-38.24%	Feb-21	$1,685
Nov-91	$210	-7.89%	Mar-21	$2,024
Dec-91	$230	-5.35%	Apr-21	$2,309
Jan-92	$274	-2.49%	May-21	$2,320
Feb-92	$283	-2.75%	Jun-21	$2,554
Mar-92	$225	-16.04%	Jul-21	$2,073
Apr-92	$170	-38.18%	Aug-21	$1,685
May-92	$177	-46.04%	Sep-21	$1,619
Jun-92	$213	-38.08%	Oct-21	$2,140
Jul-92	$185	-21.61%	Nov-21	$1,301
Aug-92	$171	-33.98%	Dec-21	$1,525
Sep-92	$139	-40.09%	Jan-22	$1,468
Oct-92	$116	-30.95%	Feb-22	$1,163
Nov-92	$127	-39.52%	Mar-22	$1,224
Dec-92	$182	-20.87%	Apr-22	$1,827

Appendix B

Operating Balance Drawdowns April 1999 – December 1999

Note all $ figures in millions

Y2K Slowdown	Monthly Operating Balance	YOY Monthly Change	What If Scenario	Projected Monthly Balance
Apr-99	$1,346	-4.32%	Nov-20	$2,160
May-99	$1,370	-3.00%	Dec-20	$2,388
Jun-99	$1,241	-4.87%	Jan-21	$2,724
Jul-99	$1,250	-6.08%	Feb-21	$2,562
Aug-99	$1,207	-5.67%	Mar-21	$2,073
Sep-99	$1,301	-3.56%	Apr-21	$2,353
Oct-99	$1,297	-3.55%	May-21	$2,295
Nov-99	$1,322	-3.10%	Jun-21	$2,545
Dec-99	$1,374	-1.09%	Jul-21	$2,442

Appendix C

Operating Balance Drawdowns March 2001 – May 2003

Note all $ figures in millions

2001 Recession	Monthly Operating Balance	YOY Monthly Change	What If Scenario	Projected Monthly Balance
Mar-01	$1,468	-4.41%	Nov-20	$2,158
Apr-01	$1,343	-8.71%	Dec-20	$2,248
May-01	$1,312	-5.93%	Jan-21	$2,693
Jun-01	$1,218	-4.07%	Feb-21	$2,617
Jul-01	$1,181	-7.28%	Mar-21	$2,038
Aug-01	$1,178	-7.89%	Apr-21	$2,247
Sep-01	$1,306	-8.39%	May-21	$2,179
Oct-01	$1,256	-14.76%	Jun-21	$2,238
Nov-01	$1,245	-18.09%	Jul-21	$2,022
Dec-01	$1,253	-17.53%	Aug-21	$2,247
Jan-02	$1,267	-24.93%	Sep-21	$2,252
Feb-02	$1,312	-20.53%	Oct-21	$2,746
Mar-02	$1,172	-20.17%	Nov-21	$1,723
Apr-02	$947	-29.50%	Dec-21	$1,585
May-02	$865	-34.04%	Jan-22	$1,776
Jun-02	$889	-26.99%	Feb-22	$1,911
Jul-02	$1,022	-13.44%	Mar-22	$1,764
Aug-02	$804	-31.69%	Apr-22	$1,535
Sep-02	$849	-35.02%	May-22	$1,416
Oct-02	$811	-35.42%	Jun-22	$1,446
Nov-02	$811	-34.83%	Jul-22	$1,318
Dec-02	$792	-36.84%	Aug-22	$1,419
Jan-03	$975	-23.06%	Sep-22	$1,733
Feb-03	$1,283	-2.23%	Oct-22	$2,685
Mar-03	$1,169	-0.20%	Nov-22	$1,720
Apr-03	$877	-7.42%	Dec-22	$1,467
May-03	$841	-2.87%	Jan-23	$1,726

Appendix D

Operating Balance Drawdowns January 2007 – June 2010

Note all $ figures in millions

Great Financial Crisis	Monthly Operating Balance	YOY change	What If Scenario	Projected Monthly Balance
Jan-07	$2,390	-5.30%	Nov-20	$2,138
Feb-07	$2,396	-6.91%	Dec-20	$2,292
Mar-07	$2,101	-21.69%	Jan-21	$2,242
Apr-07	$1,990	-23.77%	Feb-21	$2,080
May-07	$2,288	-12.51%	Mar-21	$1,923
Jun-07	$2,079	-21.09%	Apr-21	$1,925
Jul-07	$2,197	-15.31%	May-21	$2,015
Aug-07	$1,936	-14.47%	Jun-21	$2,246
Sep-07	$2,082	-9.67%	Jul-21	$2,230
Oct-07	$1,941	-16.01%	Aug-21	$2,289
Nov-07	$1,880	-14.45%	Sep-21	$2,566
Dec-07	$1,893	-13.20%	Oct-21	$3,000
Jan-08	$1,875	-21.56%	Nov-21	$1,677
Feb-08	$1,652	-31.05%	Dec-21	$1,580
Mar-08	$1,143	-45.60%	Jan-22	$1,220
Apr-08	$859	-56.83%	Feb-22	$898
May-08	$890	-61.10%	Mar-22	$748
Jun-08	$815	-60.80%	Apr-22	$755
Jul-08	$1,450	-34.00%	May-22	$1,330
Aug-08	$795	-58.94%	Jun-22	$922
Sep-08	$876	-57.93%	Jul-22	$938
Oct-08	$564	-70.94%	Aug-22	$665
Nov-08	$613	-67.39%	Sep-22	$837
Dec-08	$804	-57.53%	Oct-22	$1,274
Jan-09	$739	-60.59%	Nov-22	$661
Feb-09	$542	-67.19%	Dec-22	$518
Mar-09	$264	-76.90%	Jan-23	$282
Apr-09	$16	-98.14%	Feb-23	$17
May-09	$18	-97.98%	Mar-23	$15
Jun-09	$470	-42.33%	Apr-23	$435
Jul-09	$116	-92.00%	May-23	$106

Great Financial Crisis	Monthly Operating Balance	YOY change	What If Scenario	Projected Monthly Balance
Aug-09	($200)	-125.16%	Jun-23	($232)
Sep-09	$11	-98.74%	Jul-23	$12
Oct-09	($226)	-140.07%	Aug-23	($266)
Nov-09	($431)	-170.31%	Sep-23	($588)
Dec-09	($733)	-191.17%	Oct-23	($1,162)
Jan-10	($463)	-162.65%	Nov-23	($414)
Feb-10	($423)	-178.04%	Dec-23	($405)
Mar-10	($686)	-359.85%	Jan-24	($732)
Apr-10	($635)	-4068.75%	Feb-24	($664)
May-10	($579)	-3316.67%	Mar-24	($487)
Jun-10	$450	-4.26%	Apr-24	$417

Appendix E

Operating Balance Drawdowns April 2014 – July 2015

Note all $ figures in millions

2014-2015 Slowdown	Monthly Operating Balance	YOY Monthly Change	What If Scenario	Projected Monthly Balance
Apr-14	$2,098	-0.52%	Nov-20	$2,246
May-14	$2,311	-4.78%	Dec-20	$2,344
Jun-14	$2,462	-8.07%	Jan-21	$2,632
Jul-14	$1,877	-3.35%	Feb-21	$2,637
Aug-14	$1,369	-19.89%	Mar-21	$1,761
Sep-14	$1,638	-16.98%	Apr-21	$2,026
Oct-14	$1,521	-16.61%	May-21	$1,984
Nov-14	$1,535	-17.16%	Jun-21	$2,175
Dec-14	$1,478	-22.01%	Jul-21	$1,926
Jan-15	$1,754	-21.45%	Aug-21	$2,140
Feb-15	$1,957	-19.37%	Sep-21	$2,419
Mar-15	$1,686	-19.98%	Oct-21	$2,765
Apr-15	$1,879	-10.44%	Nov-21	$2,012
May-15	$2,163	-6.40%	Dec-21	$2,194
Jun-15	$2,307	-6.30%	Jan-22	$2,466
Jul-15	$1,795	-4.37%	Feb-22	$2,522

Appendix F

Operating Balance Drawdowns August 2016 – March 2018

Note all $ figures in millions

2016-2018 Slowdown	Monthly Operating Balance	YOY Monthly Change	What If Scenario	Projected Monthly Balance
Aug-16	$1,504	-3.22%	Nov-20	$2,185
Sep-16	$1,694	-9.61%	Dec-20	$2,226
Oct-16	$1,672	-1.70%	Jan-21	$2,814
Nov-16	$1,634	-3.08%	Feb-21	$2,644
Dec-16	$1,693	-2.36%	Mar-21	$2,146
Jan-17	$2,255	5.42%	Apr-21	$2,572
Feb-17	$2,306	0.52%	May-21	$2,391
Mar-17	$1,968	-5.93%	Jun-21	$2,470
Apr-17	$1,961	-18.53%	Jul-21	$2,012
May-17	$2,215	-18.57%	Aug-21	$2,219
Jun-17	$2,147	-17.10%	Sep-21	$2,487
Jul-17	$1,635	-18.74%	Oct-21	$2,808
Aug-17	$1,303	-13.36%	Nov-21	$1,893
Sep-17	$1,455	-14.11%	Dec-21	$1,912
Oct-17	$1,472	-11.96%	Jan-22	$2,478
Nov-17	$1,417	-13.28%	Feb-22	$2,293
Dec-17	$1,401	-17.25%	Mar-22	$1,776
Jan-18	$2,140	-5.10%	Apr-22	$2,441
Feb-18	$2,244	-2.69%	May-22	$2,327
Mar-18	$1,937	-9.78%	Jun-22	$2,229

Appendix G

Tables of Endowment Distributions FY 2016- FY 2027

Note italicized figures are projections

Repeat of the 2007-2009 GFC starting Nov 1, 2020

Fiscal Year	Annual distributions	Monthly	Average CY Market Value
FY2016	$277,442,315	$23,120,193	$5,192,433,678
FY2017	$289,935,195	$24,161,266	$5,643,307,366
FY2018	$316,998,617	$26,416,551	$5,885,522,778
FY2019	$345,423,972	$28,785,331	$6,045,148,266
FY2020	$367,974,828	$30,664,569	*$6,095,139,702*
FY2021	$384,772,344	$32,064,362	*$5,609,919,637*
FY2022	*$398,289,415*	*$33,190,785*	*$5,210,526,486*
FY2023	*$404,050,721*	*$33,670,893*	*$6,214,975,627*
FY2024	*$398,078,345*	*$33,173,195*	*$6,957,278,183*
FY2025	*$402,624,794*	*$33,552,066*	*$7,552,752,564*
FY2026	*$150,439,198*	*$12,536,600*	*$8,447,111,529*
FY2027	*$157,727,262*	*$13,143,939*	*$9,319,660,534*

Appendix H

Tables of Endowment Distributions FY 2016- FY 2027

Note italicized figures are projections

Repeat of the 2000-2001 Tech Bubble starting Nov 1, 2020

Fiscal Year	Annual distributions	Monthly	Average CY Market Value
FY2016	$277,442,315	$23,120,193	$5,192,433,678
FY2017	$289,935,195	$24,161,266	$5,643,307,366
FY2018	$316,998,617	$26,416,551	$5,885,522,778
FY2019	$345,423,972	$28,785,331	$6,045,148,266
FY2020	$367,974,828	$30,664,569	*$6,118,043,488*
FY2021	$384,772,344	$32,064,362	*$6,427,383,641*
FY2022	*$398,605,487*	*$33,217,124*	*$6,410,118,648*
FY2023	*$415,647,796*	*$34,637,316*	*$6,142,535,811*
FY2024	*$426,229,792*	*$35,519,149*	*$7,209,763,242*
FY2025	*$429,776,572*	*$35,814,714*	*$7,892,788,990*
FY2026	*$161,539,224*	*$13,461,602*	*$8,628,515,449*
FY2027	*$170,412,952*	*$14,201,079*	*$9,377,375,323*

Appendix I

Tables of Endowment Distributions FY 2016- FY 2027

Note italicized figures are projections

Repeat of 1987 Black Monday crash starting Nov. 1, 2020

Fiscal Year	Annual distributions	Monthly	Average CY Market Value
FY2016	$277,442,315	$23,120,193	$5,192,433,678
FY2017	$289,935,195	$24,161,266	$5,643,307,366
FY2018	$316,998,617	$26,416,551	$5,885,522,778
FY2019	$345,423,972	$28,785,331	$6,045,148,266
FY2020	$367,974,828	$30,664,569	*$5,970,606,013*
FY2021	$384,772,344	$32,064,362	*$5,923,174,430*
FY2022	*$396,570,850*	*$33,047,571*	*$6,893,095,675*
FY2023	*$406,655,072*	*$33,887,923*	*$7,262,474,220*
FY2024	*$423,902,151*	*$35,325,179*	*$8,189,439,973*
FY2025	*$442,904,081*	*$36,908,673*	*$9,204,212,166*
FY2026	*$171,193,952*	*$14,266,163*	*$10,112,951,026*
FY2027	*$187,361,982*	*$15,613,499*	*$10,277,024,719*

Appendix J

Tables of Endowment Distributions FY 2016- FY 2027

Note italicized figures are projections

Repeat of early 1980s recessions starting Nov 1, 2020

Fiscal Year	Annual distributions	Monthly	Average CY Market Value
FY2016	$277,442,315	$23,120,193	$5,192,433,678
FY2017	$289,935,195	$24,161,266	$5,643,307,366
FY2018	$316,998,617	$26,416,551	$5,885,522,778
FY2019	$345,423,972	$28,785,331	$6,045,148,266
FY2020	$367,974,828	$30,664,569	*$6,081,767,658*
FY2021	$384,772,344	$32,064,362	*$6,010,296,777*
FY2022	*$398,104,880*	*$33,175,407*	*$6,666,108,839*
FY2023	*$409,391,391*	*$34,115,949*	*$8,762,075,389*
FY2024	*$423,506,052*	*$35,292,171*	*$9,534,476,190*
FY2025	*$463,202,478*	*$38,600,206*	*$10,763,738,554*
FY2026	*$185,273,624*	*$15,439,469*	*$13,192,044,432*
FY2027	*$208,683,479*	*$17,390,290*	*$15,259,991,197*