

When Forecasts Go Wrong

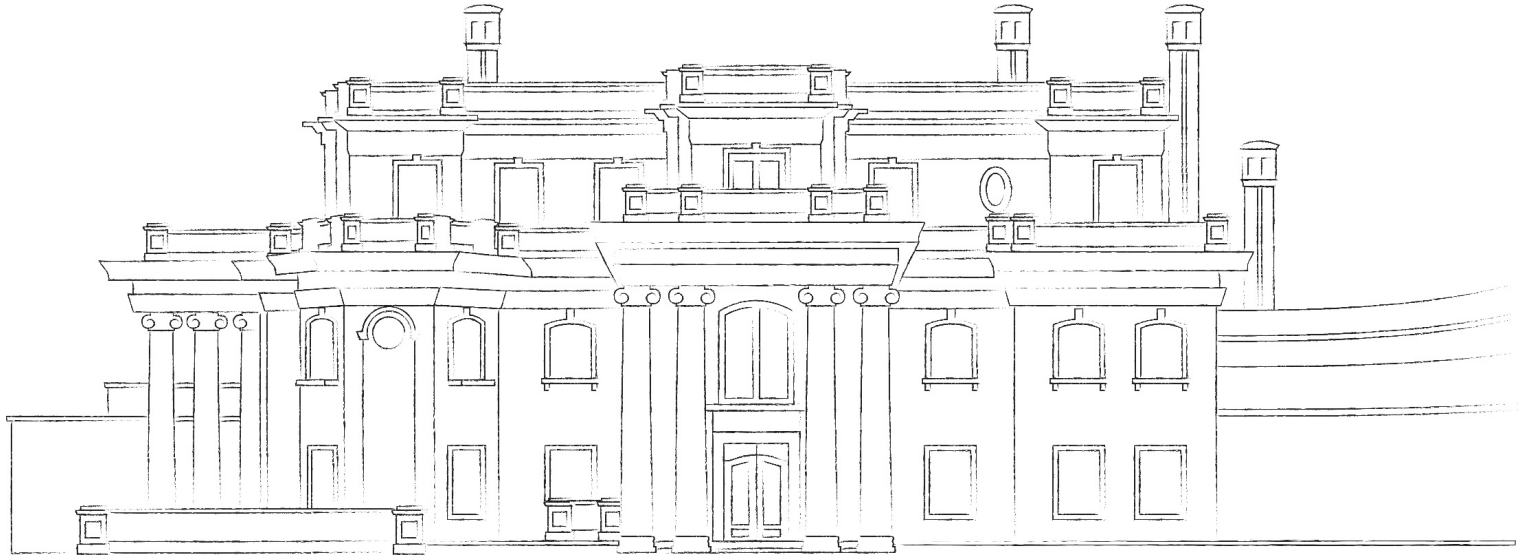
July 22, 2024

Council of State Governments (CSG) Midwest
Legislative Conference Annual Meeting
Columbus, Ohio



DAVID ECCLES SCHOOL OF BUSINESS

Kem C. Gardner Policy Institute



Our Vision: *Be Utah's preeminent public policy institute and a vital gathering place for policy leadership and thoughtful discourse that helps our community prosper.*

Our Mission: *Develop and share economic, demographic, and public policy research that sheds light and helps people make INFORMED DECISIONS™.*

Our purpose is to help people make

**INFORMED
DECISIONS™**

Setting the Stage

1. Dissonant Economic Indicators Signal Unsettled Normalcy

- With strong household finances in general, demand continues, but moderating from overheated demand
- Inflation from overheated demand spurred interest rate increases
- Supply-side constraints still limit growth

2. A Cloudy Crystal Ball – Strategic Forecasting Amid Uncertainty

- State revenues strong in recent years, but sustainability uncertain
- Under-forecasts and over-forecasts both carry risks
- How solid is your forecast insurance?

3. Intentionally Select Forecast Risk Tolerance Level Considering Fiscal Health

Current Economic Conditions

**Dissonant Economic Indicators Signal
Unsettled Normalcy**

Megatrend – Declining Fertility Rates

The economy is moving us
back into the 19th century
as fertility rates plunge

BY SYDNEY LAKE
April 26, 2024 at 2:31 PM MDT

FORTUNE

Declining fertility rates will transform global
economy, report says **FINANCIAL TIMES**

**US fertility rate dropped to lowest in a century as
births dipped in 2023**

CNN Health

The Lancet: Dramatic declines in global fertility rates set
to transform global population patterns by 2100

Published March 20, 2024

U.S. Fertility Rate Falls to Record Low

Fewer babies were born in the U.S. in 2023 than any year since 1979

THE WALL STREET JOURNAL

Why Should I Care About Demographics?

Age structure and demographic waves impact government revenues and spending

- **Revenues**
 - Consumption differs by age, even in “normal” times
 - Income sources and income levels differ by age
- **Spending**
 - Education (K-12 and higher education)
 - Medicaid



Gen Z and Millennials are scrimping. Boomers? Living it up

By [Matt Egan](#), CNN Business

🕒 3 minute read · Updated 1:08 PM EDT, Mon June 12, 2023

Stocks and Flows Vary Over a Lifetime

Most Forecasts Pay Little Attention to Age Structure

Income, Consumption, and Wealth

Income

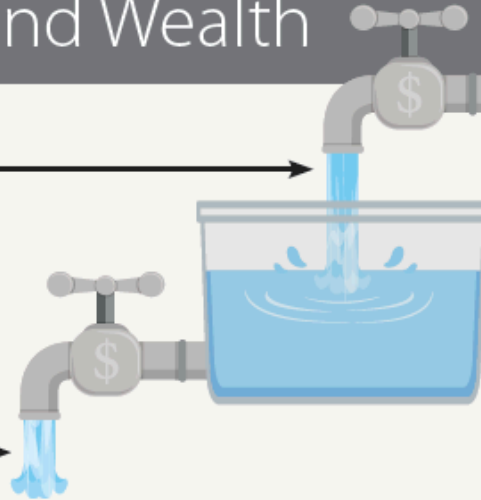
(Flow variable)

- Wages
- Dividends
- Interest
- Capital Gains

Consumption

(Flow variable)

- Housing
- Groceries
- Utilities
- Health Care
- Transportation



Assets

(Stock variable)

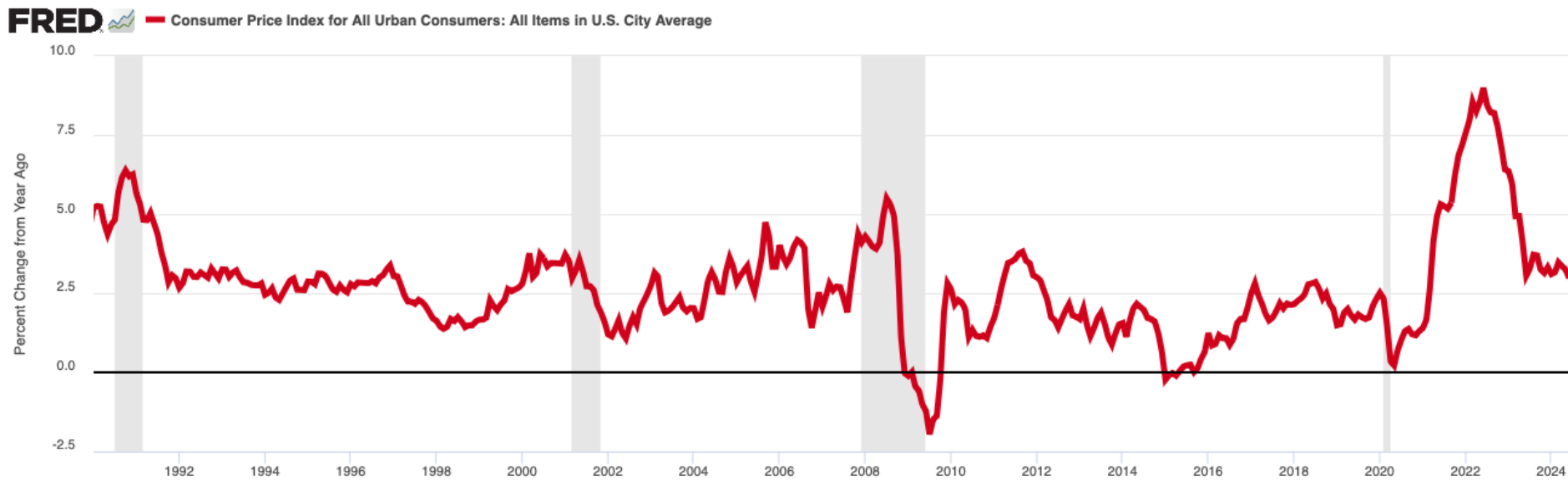
- Cash
- Stocks
- Bonds
- Real Estate
- Cars

Interest Rates Higher (Than Historic Lows)



How Well Do Your Forecast Models Capture Inflation's Continuing Impacts?

Consider Real Per Capita Estimates

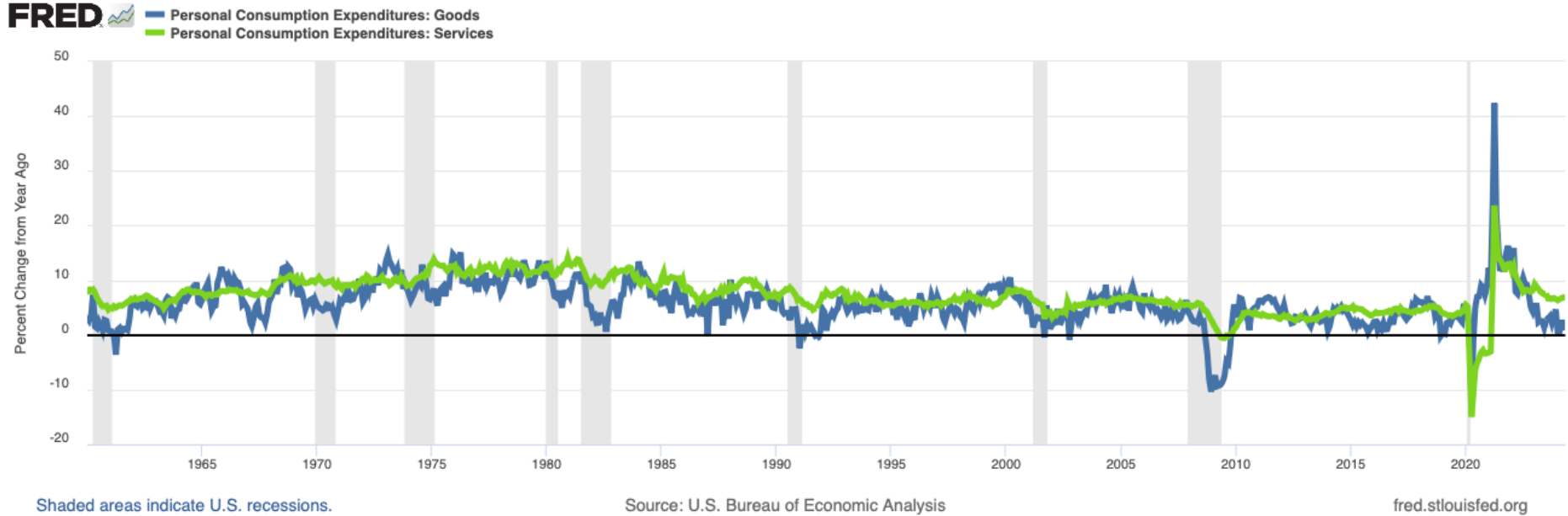


Shaded areas indicate U.S. recessions.

Source: U.S. Bureau of Labor Statistics

fred.stlouisfed.org

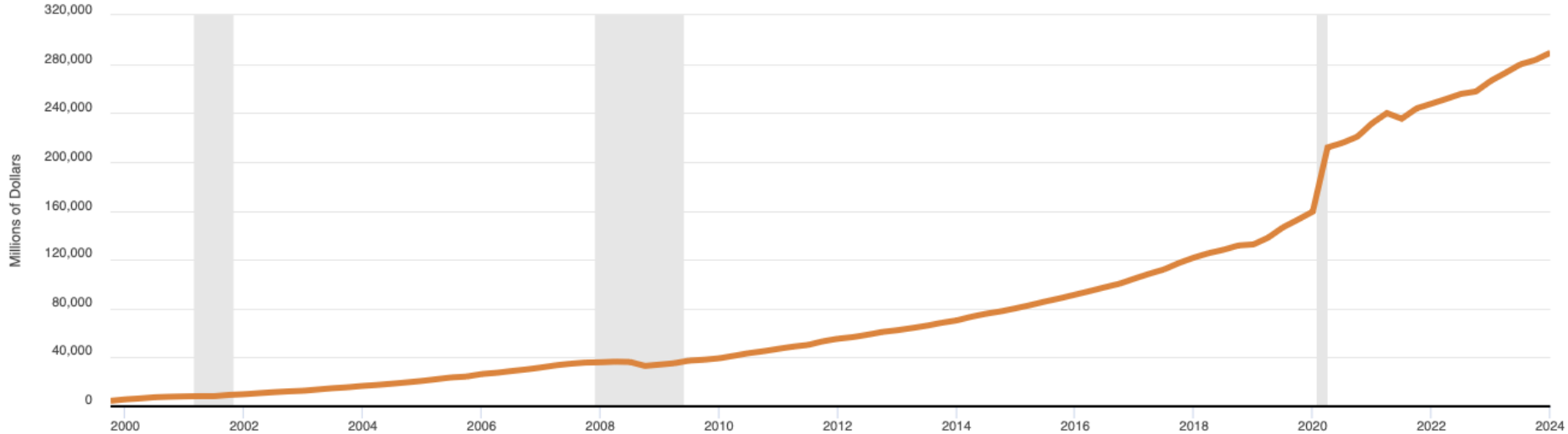
Economy Returning to More Normal Consumption Flows



How Are You Estimating Remote Sales Flows?

FRED

E-Commerce Retail Sales

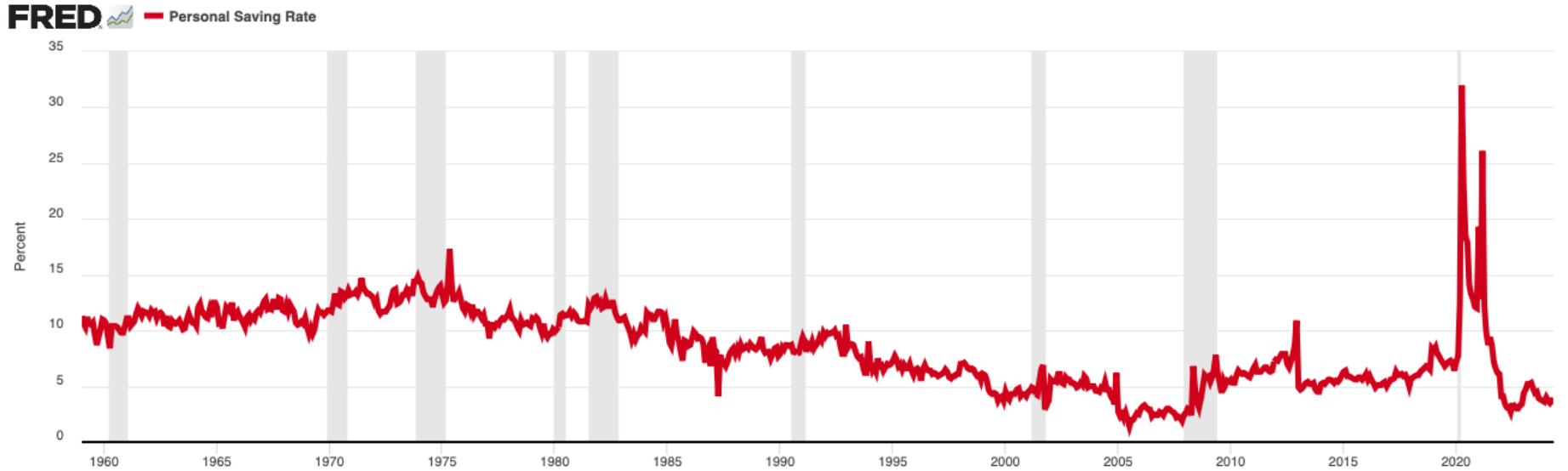


Shaded areas indicate U.S. recessions.

Source: U.S. Census Bureau

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Should We Worry About Low Personal Savings Flows?

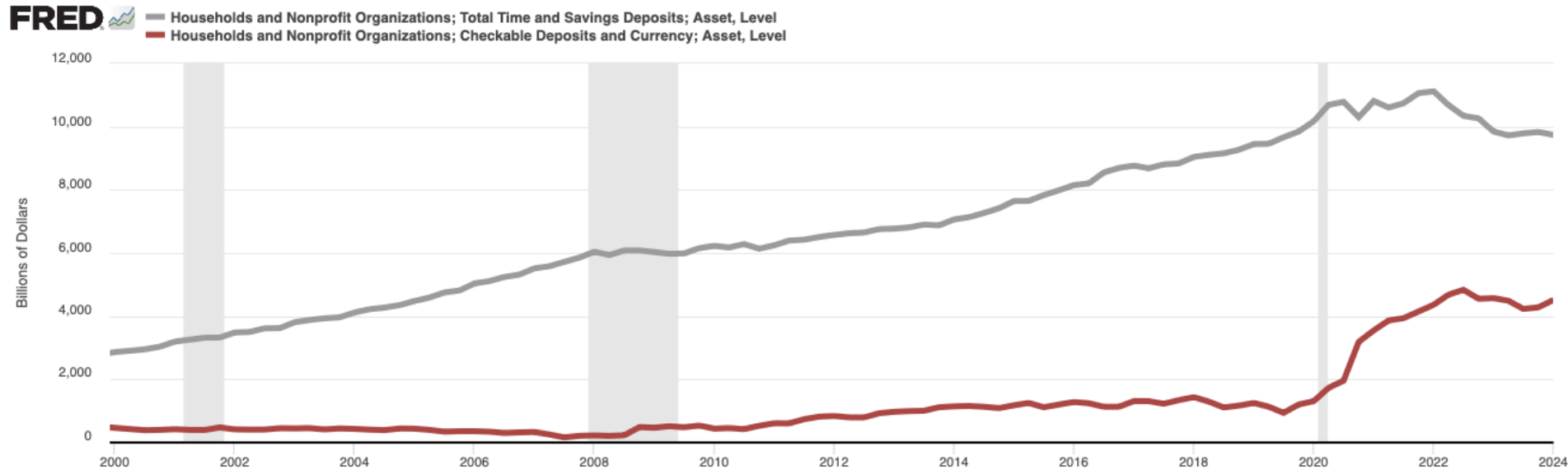


Shaded areas indicate U.S. recessions.

Source: U.S. Bureau of Economic Analysis

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Stock of Savings Still Elevated (Sitting in Checking Accounts)



Shaded areas indicate U.S. recessions.

Source: Board of Governors of the Federal Reserve System (US)

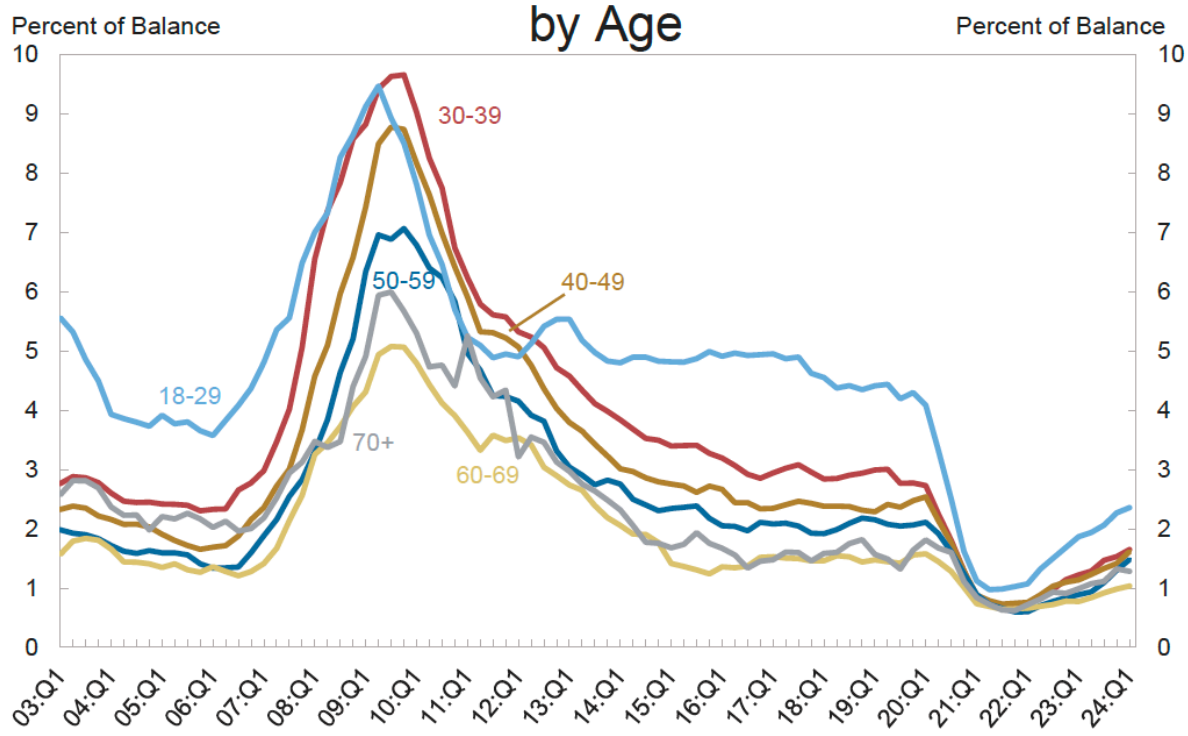
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Debt Service Payment Flows Still Manageable Overall



Largest Delinquency Upticks Among Youngest

Transition into Serious Delinquency (90+)



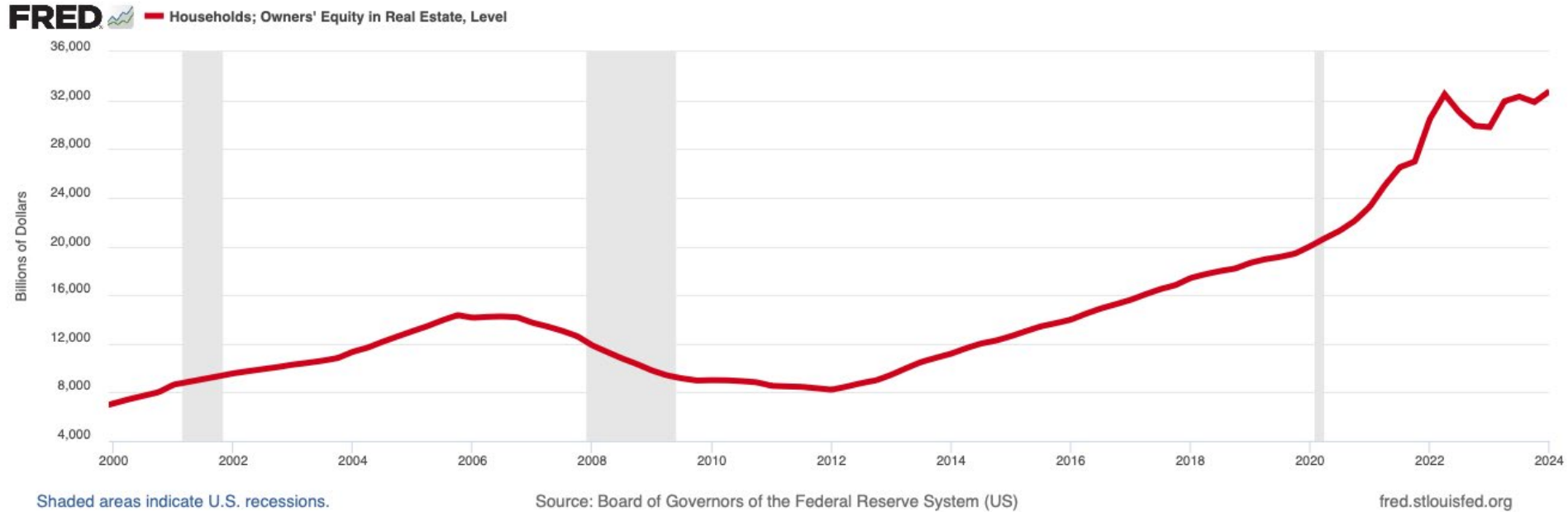
Note: 4 Quarter Moving Sum.

Age is defined as the current year minus the birthyear of the borrower.

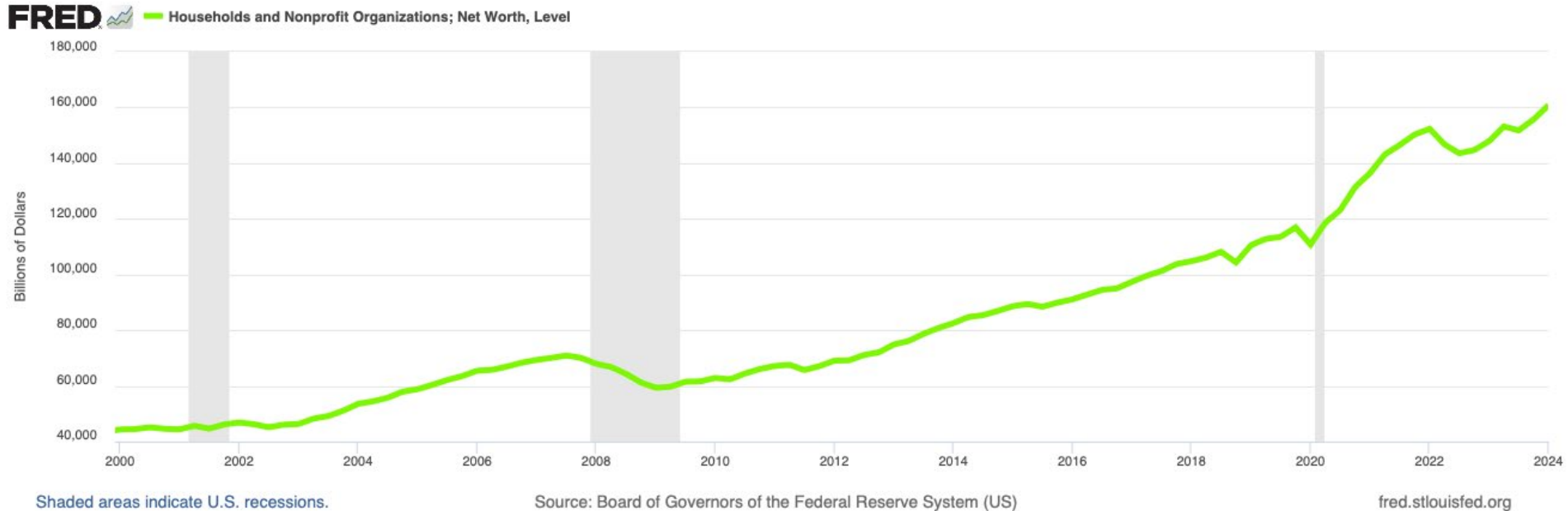
Age groups are re-defined each year.

Source: New York Fed Consumer Credit Panel/Equifax

Incumbent Homeowner Wealth Stock High Overall



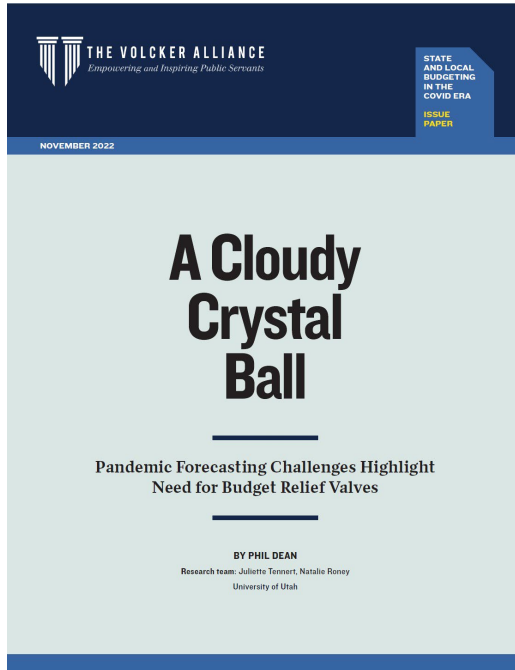
Household Wealth Stock High Overall



Strategic Forecasting Amid Uncertainty

A Cloudy Crystal Ball

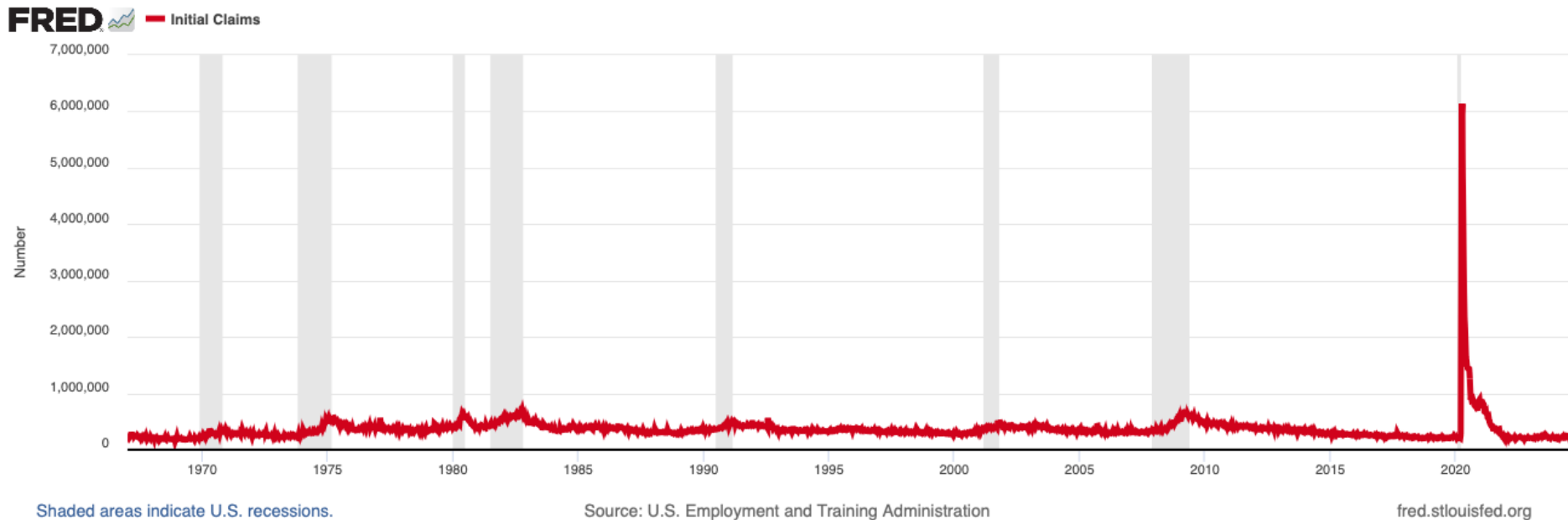
Pandemic Forecasting Challenges Highlight Need for Budget Relief Valves



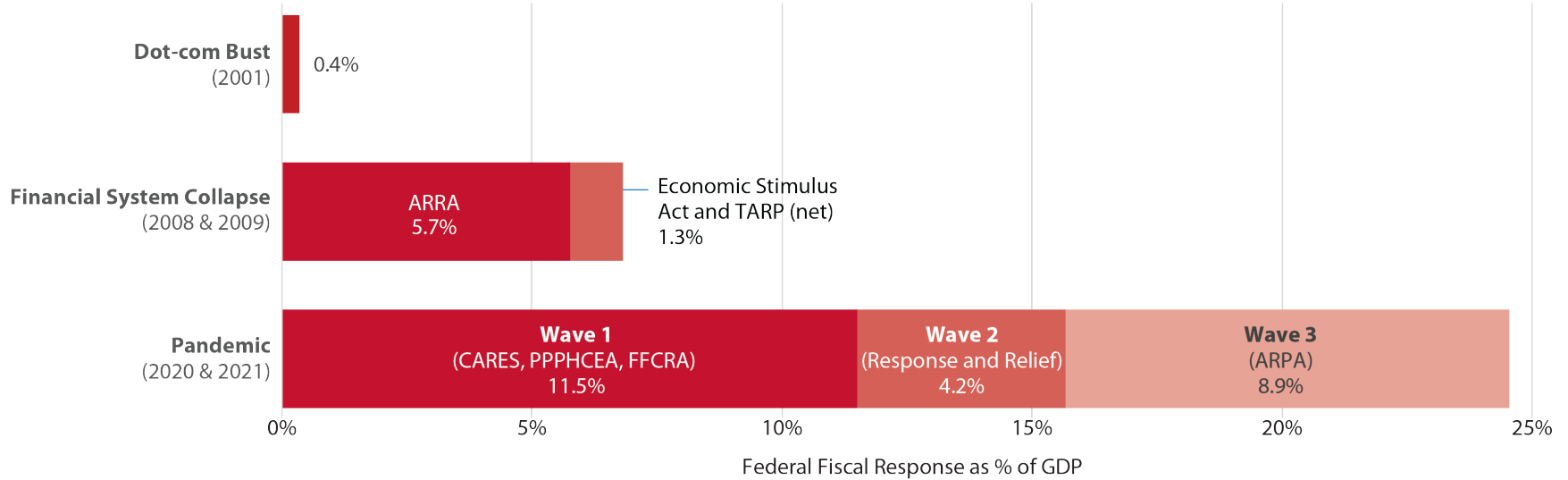
- Highlights forecasting and budget management lessons learned from the pandemic
- Tool kit on various best practices and how states forecast budgets

https://www.volckeralliance.org/sites/default/files/2022-11/ACloudyCrystalBall_113022.pdf

Did You Forecast This?



Or This Federal Fiscal Response?



Source: Kem C. Gardner Policy Institute from CBO and BEA data

Select Forecast Risk Considering Overall Fiscal Health (Strength or Weakness of Other Budget Tools)

STRENGTH OF OTHER BUDGET MANAGEMENT TOOLS

(including revenue stability, reserve accounts, and long-term liabilities)

WEAK

STRONG

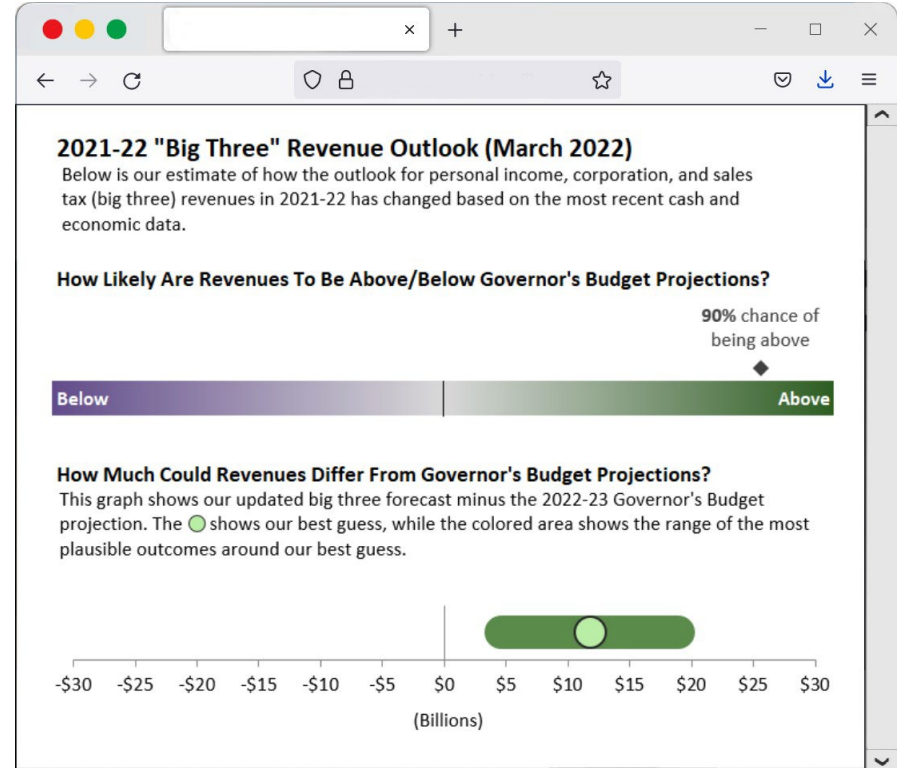
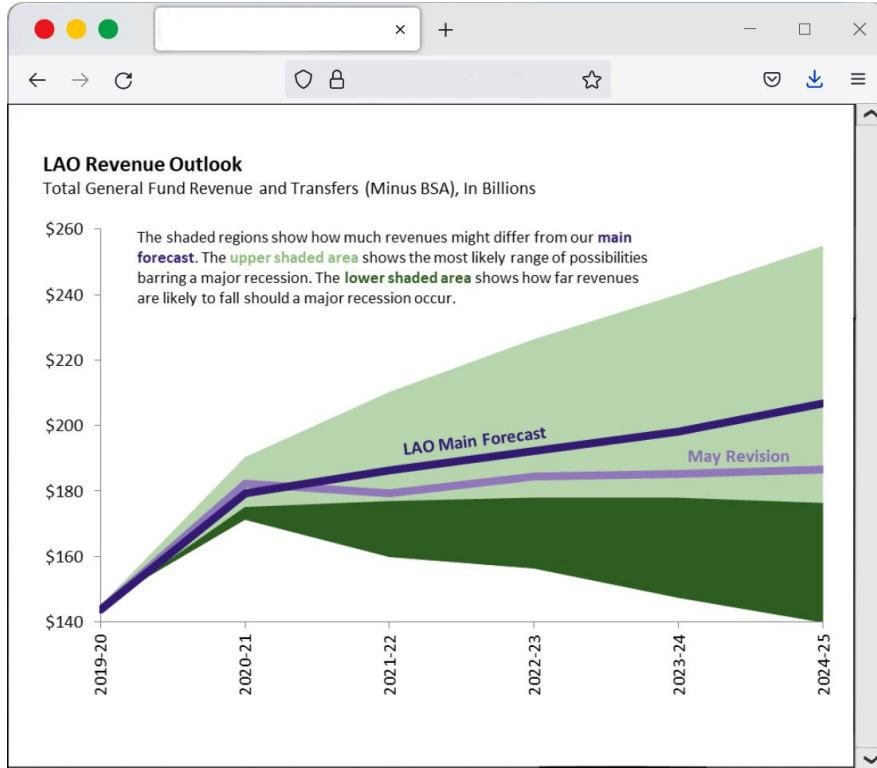
EMPLOY VERY LOW-RISK FORECAST

EMPLOY 50-50 FORECAST

States control broad range of budget management tools

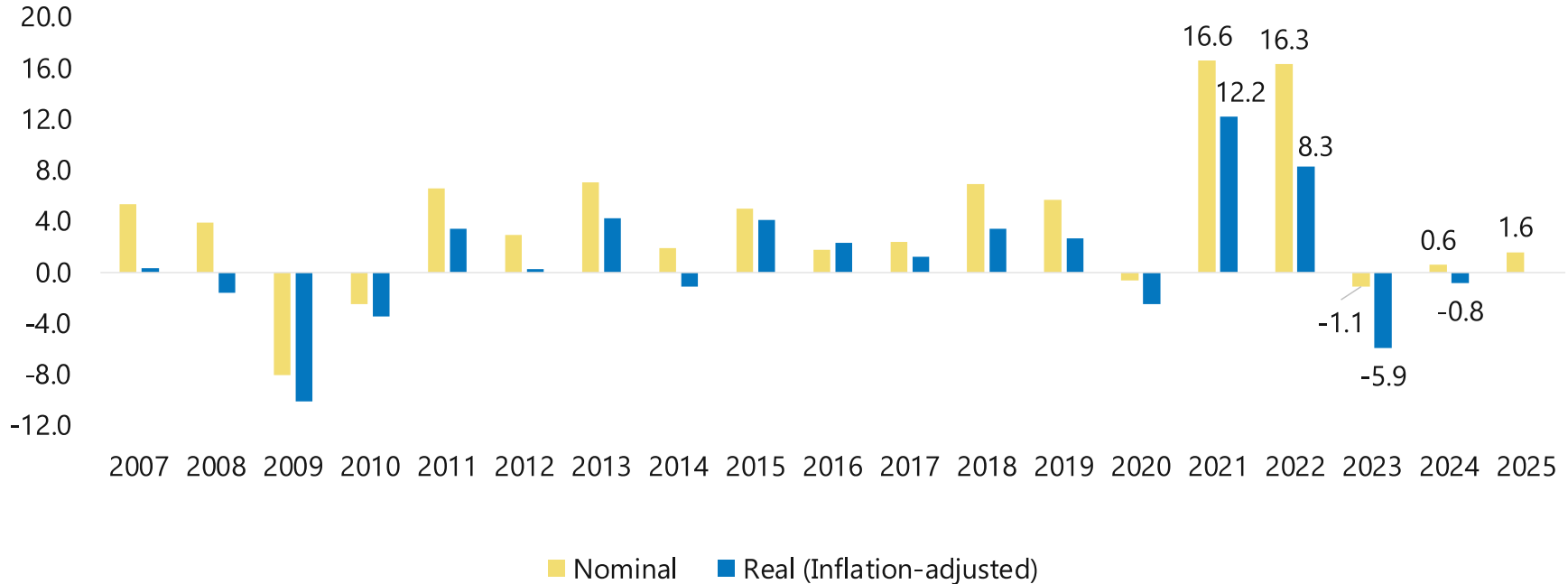
- Revenue system design
- Budget reserves
 - Formal rainy day funds
 - Other balances in special/restricted accounts
- Cash flow management
- State spending levels

Adopted Forecast Represents a Point in a Range of Possibilities Consider Your Risk Tolerance Level



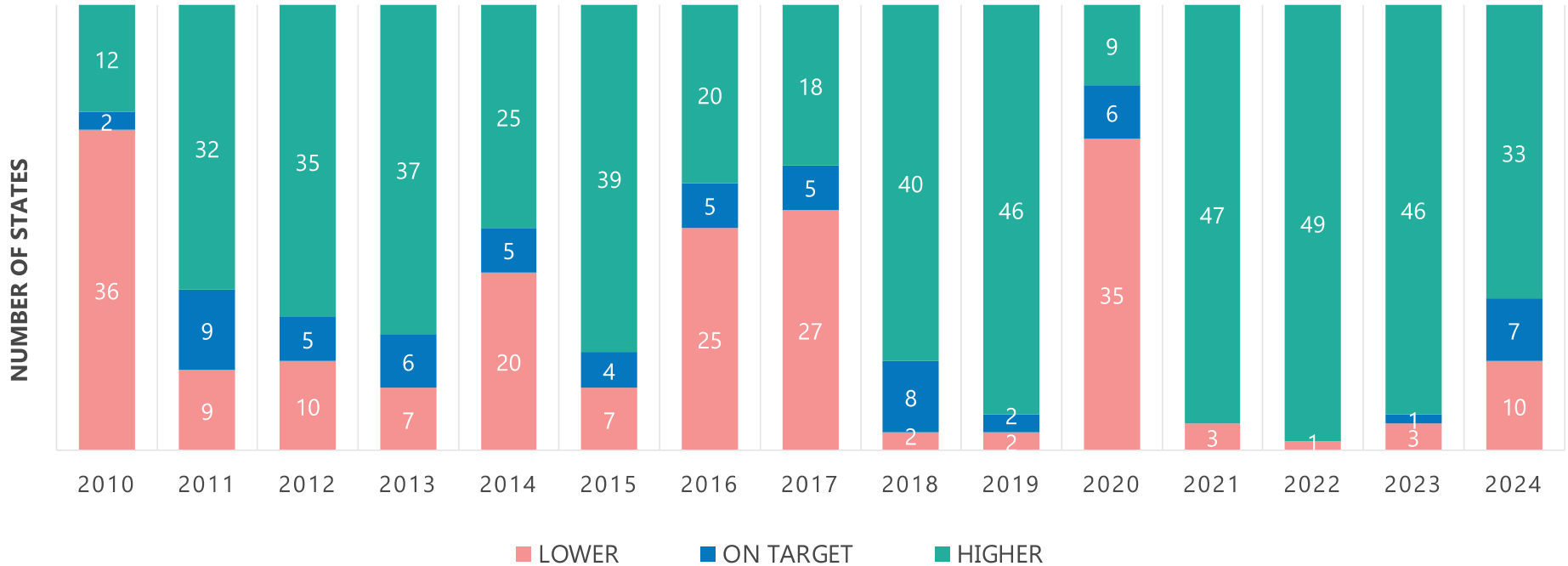
SOURCE California Legislative Analyst's Office

Nominal Revenue Growth Slower Due to Combined Effects of Tax Cuts and Moderating Economy



Source: National Association of State Budget Officers

State Revenue Forecast Accuracy



Source: National Association of State Budget Officers

Missed Forecasts (High and Low) Carry Different Risks

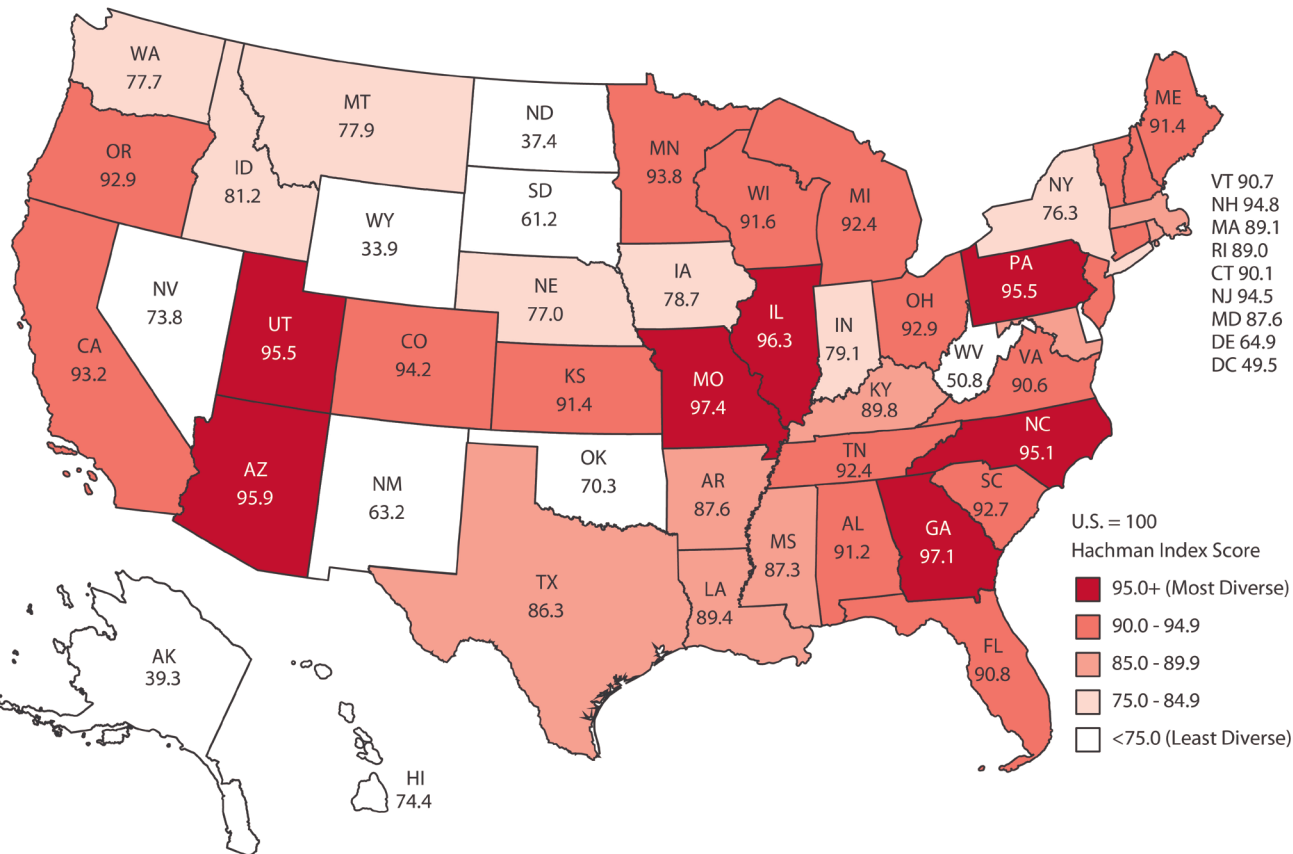
Revenue forecast too high (year-end shortfall)

- Risks future budget cuts or tax increases
- Forecast miss leads to drawing down rainy day funds or other reserves
- Most states hedge slightly to avoid shortfalls
- Managing from budget crisis to crisis undermines long-term strategic management, shifting focus to short-term pressures

Revenue forecast too low (year-end surplus)

- Risks missing opportunities to productively use funds in high-inflation economy
- May shift funding from ongoing people-oriented programs to one-time object-oriented programs
- Consistent large under-forecast undermines credibility
- Collected funds spendable later
- Avoids forecast-driven future budget cuts or tax increases

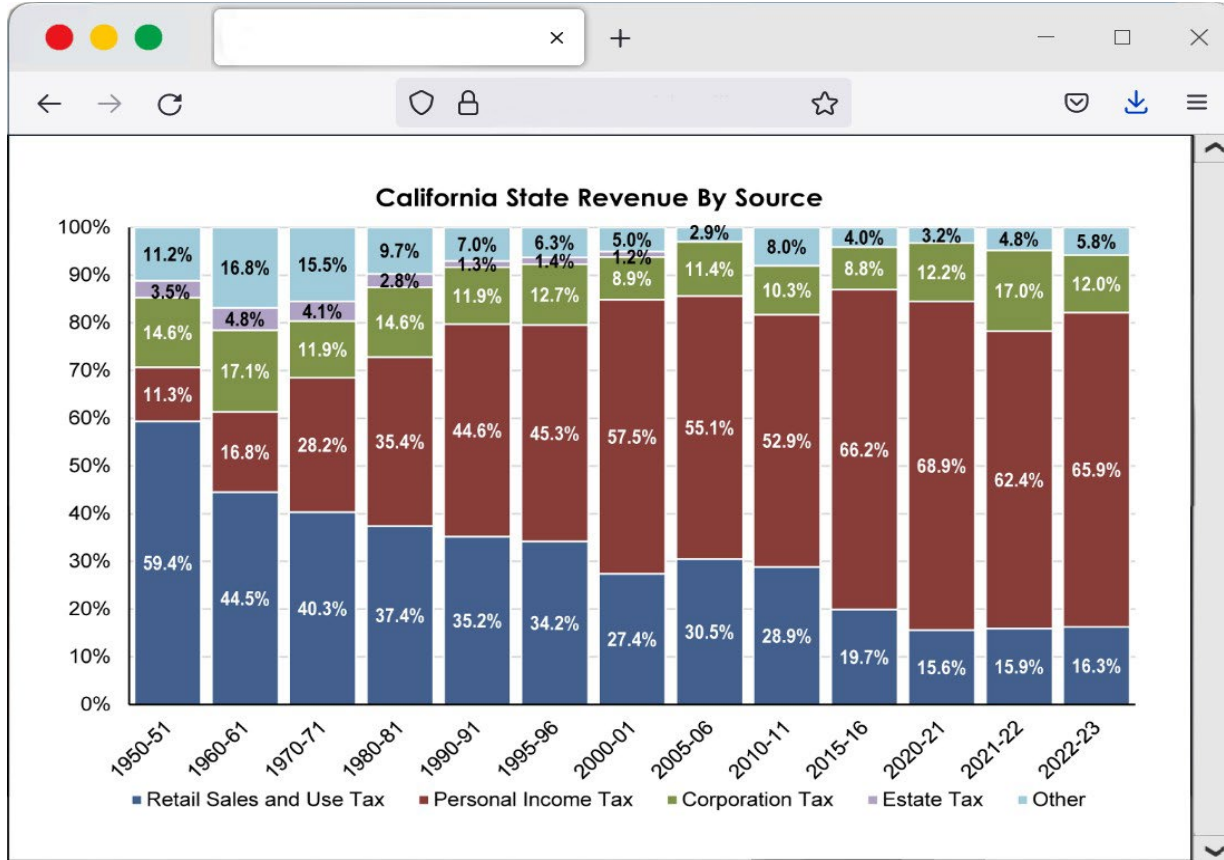
Economic Structure Impacts Revenues



Hachman Index
measures economic
diversity relative to
US economy

SOURCE Gardner Policy Institute

System Design Impacts State Revenues

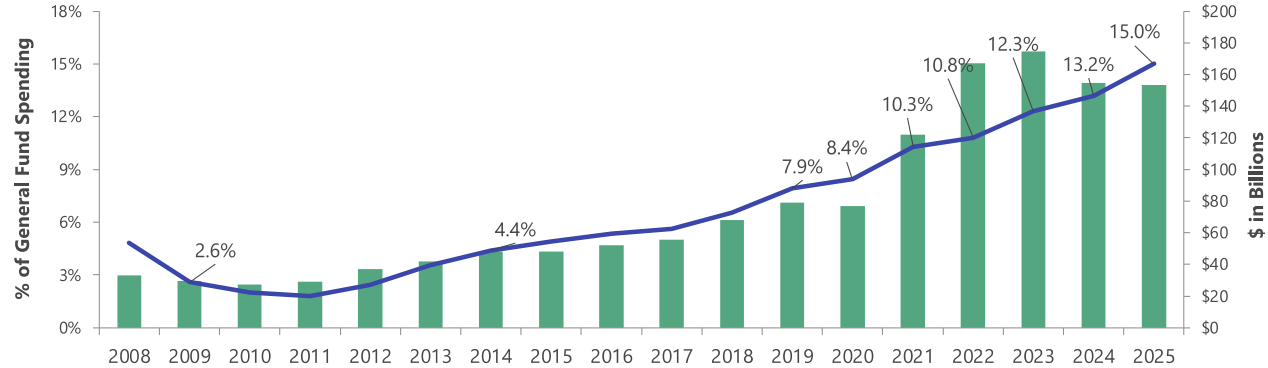


Like many states, California's tax system design has selected more volatile income taxes over time, **increasing forecast challenges**

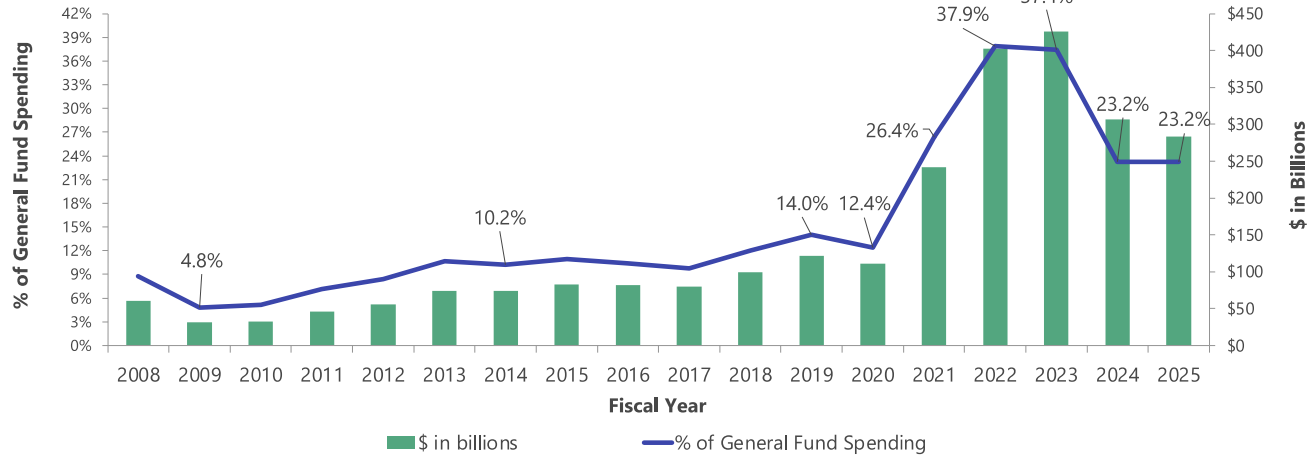
SOURCE California Department of Finance

State Budget Reserves Very Strong Post-Pandemic

Rainy Day Fund



Rainy Day Fund + General Fund Unobligated Balance

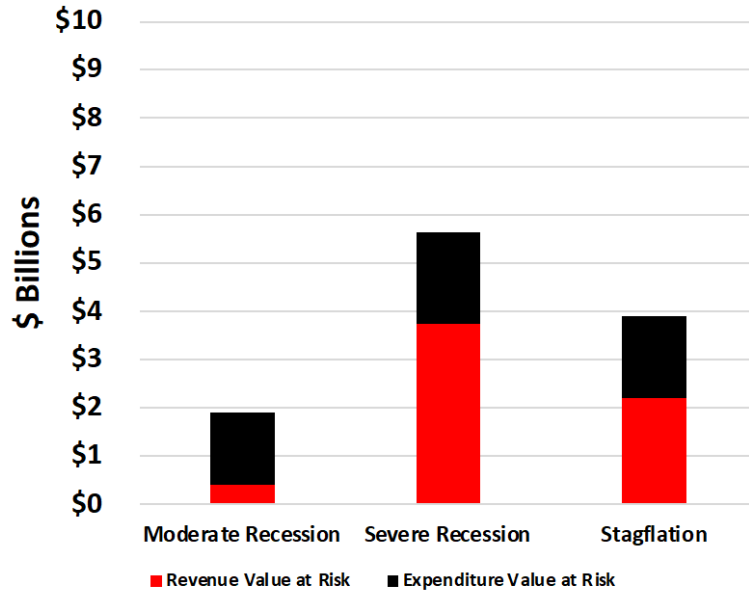


Source: National Association of State Budget Officers

Budget Stress Testing Can Help States Evaluate Budget Preparation Levels

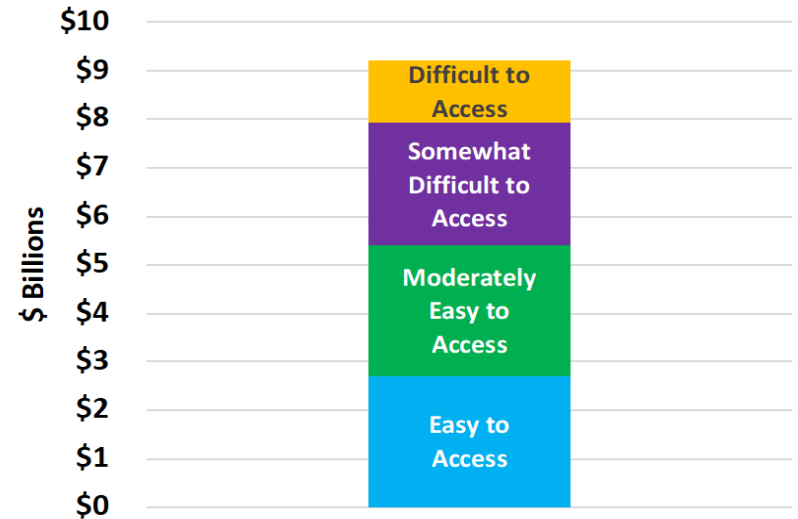
Risk

Revenue Declines and Expenditure Increases



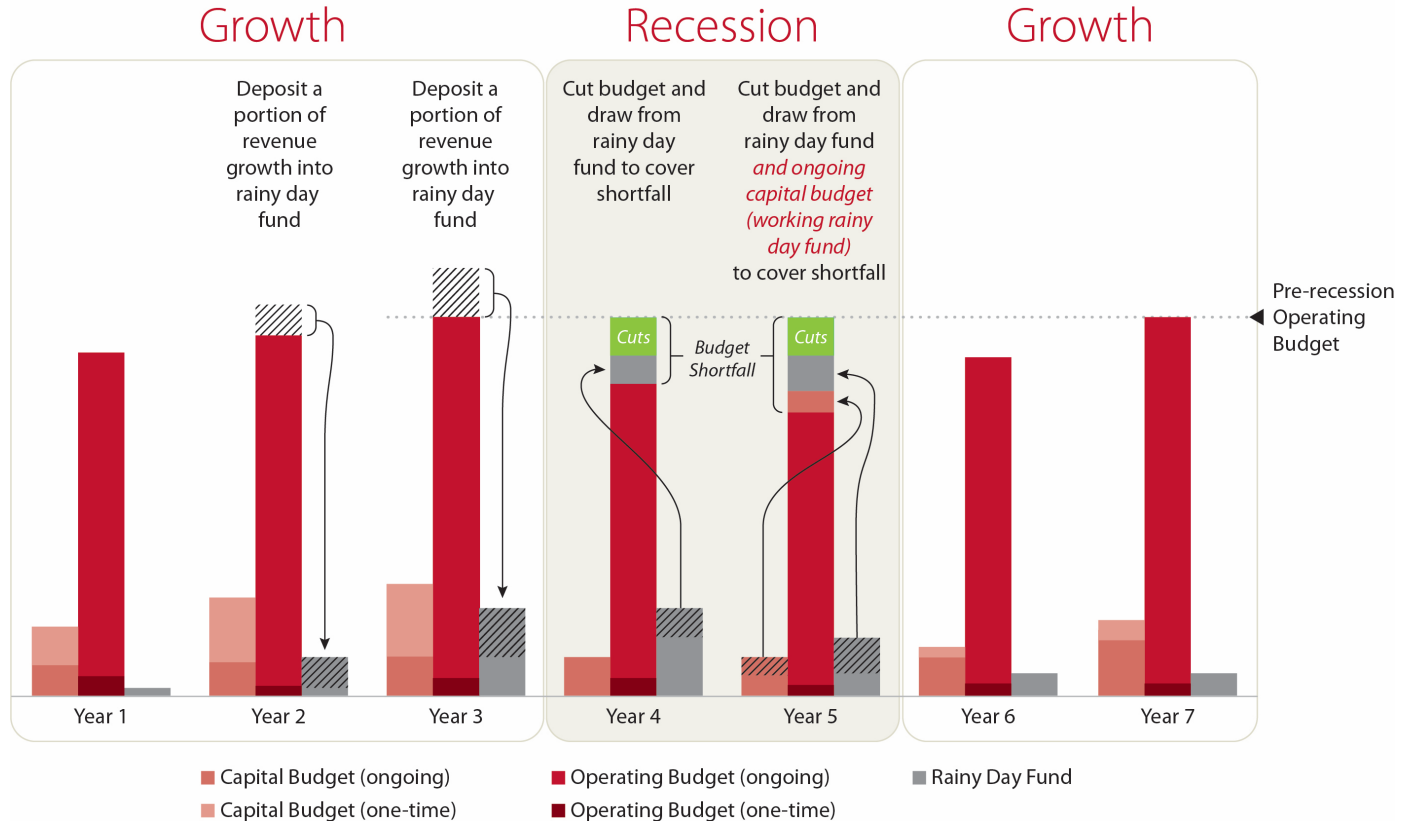
Reserve Options

by Ease of Accessibility



SOURCE Utah Governor's Office of Planning and Budget and Legislative Fiscal Analyst

“Working” Rainy Day Funds - Building in a Structural Surplus via Capital Budget



Stress Testing – Why Should Anyone Care?

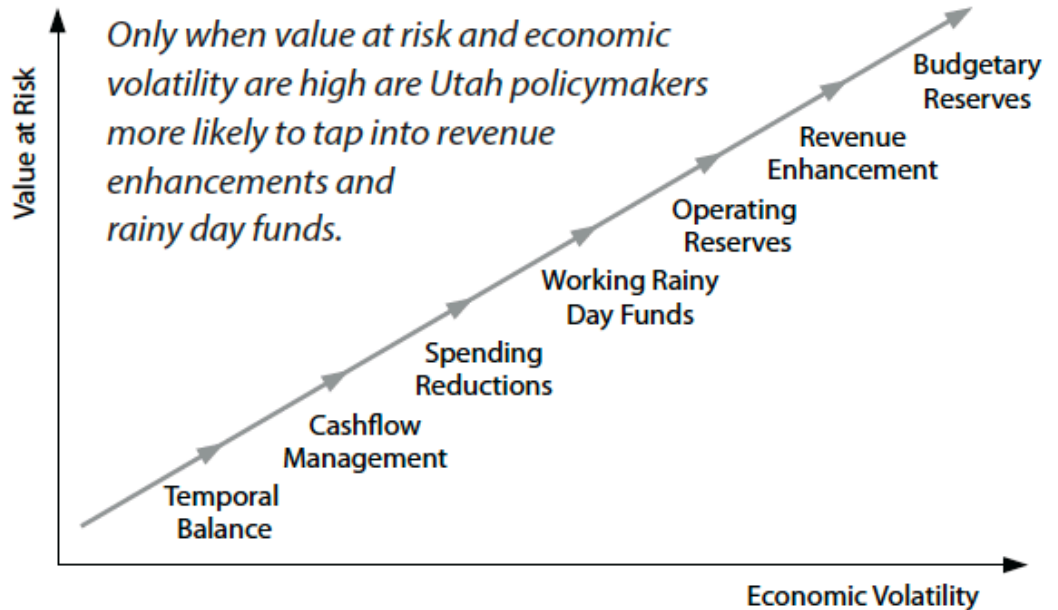
1. Forecasts are wrong
2. Spending-side demands often increase during downturns
3. States can choose to prepare or be reactionary during a crisis – make it up on the fly or execute on a playbook developed beforehand
4. Federal government may or may not come through
5. Preparation level can inform forecast risk assumed

Shifting Focus from Annually-Balanced Budget to Long-Term Fiscal Sustainability

**Utah's fiscal
playbook for
managing budget
over the business
cycle**

Utah's Fiscal Toolkit

Reserves and Other Budget Contingencies



Utah Budget Stress Testing Process

1. Define Analysis Period
2. Identify Key Independent and Dependent Forecast Variables
3. Determine Alternative Economic Scenarios
4. Estimate Revenue and Spending at Risk
5. Inventory and Categorize Existing Reserves and Other Budget Contingencies
6. Compare Total Reserves & Budget Contingencies to Total Value at Risk
7. Explain It! Concisely Present Findings



State Budget Stress Testing User Guide

A collaborative endeavor of the Kem C. Gardner Policy Institute and the Utah Office of the Legislative Fiscal Analyst

June 2019

1 – Define Analysis Period



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Considerations:

- Annual or biennial state
- Time period available under alternative economic scenario(s) selected
- Forecast error acceptability
- Timing sensitivity of major budget drivers (revenue and spending)
- Short-term v. long-term budget impacts

Phil's Takeaway:

- 3-5 years probably best
- BUT...review annual impacts over period

2 – Identify Key Independent and Dependent Forecast Variables

Considerations:

- What are major revenue streams?
- What are major spending categories?
- Historically, how sensitive are state revenues and spending to business and demographic cycles?
- What indicators do you use to forecast?



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Phil's Takeaway:

- Simpler is better – you could include all revenues and all spending, but is it worth the effort?
- Which are your top 10 (or fewer??) critical forecasting variables?

Identify Key Revenue and Spending Drivers

Largest Revenue Streams:

- Individual income tax
- Sales and use tax
- Corporate income tax
- Some states - extraction taxes, tourism taxes, etc.

Major Spending Drivers:

- Medicaid
- K-12
- Higher education
- Employee compensation
 - Retirement contributions
 - Some states – union contracts

Scenario Economic Indicators May Misalign With Normal Forecast Process Indicators

February 23

ECONOMIC INDICATORS FOR UTAH AND THE UNITED STATES, FEBRUARY 2023

ECONOMIC INDICATORS	UNITS	2020	2021	2022	2023	2024	PERCENT CHANGE			
		ACTUAL	ACTUAL	ESTIMATE	FORECAST	FORECAST	2021	2022	2023	2024
PRODUCTION AND SPENDING										
U.S. Real Gross Domestic Product	Billion Chained \$2012	18,509	19,610	20,018	20,164	20,493	5.9	2.1	0.7	1.6
U.S. Real Personal Consumption	Billion Chained \$2012	12,701	13,754	14,140	14,281	14,437	8.3	2.8	1.0	1.1
U.S. Real Private Fixed Investment	Billion Chained \$2012	3,327	3,575	3,563	3,416	3,484	7.4	-0.3	-4.1	2.0
U.S. Real Federal Defense Spending	Billion Chained \$2012	239	220	206	214	214	8.1	-7.0	4.5	0.0
U.S. Real Exports	Billion Chained \$2012	2,232	2,367	2,538	2,636	2,788	6.1	7.2	3.9	5.8
Utah Real GDP	Million Chained \$2012	174,565	186,910	191,794	195,438	200,910	6.8	2.6	1.9	2.8
Utah Exports	Million Dollars	17,173	18,060	16,632	19,165	20,568	2.0	-7.9	15.2	7.3
Utah Coal Production	Million Tons	13.3	12.3	11.0	10.5	12.0	-7.4	-11.1	-8.9	20.0
Utah Crude Oil Production	Million Barrels	31.0	35.5	44.6	45.5	44.0	14.6	25.6	2.0	-3.3
Utah Natural Gas Production Sales	Billion Cubic Feet	243	240	260	245	240	-1.1	8.4	-5.8	-2.0
Utah Copper Mine Production	Million Pounds	309	351	397	420	450	13.6	13.1	5.8	7.1
SALES AND CONSTRUCTION										
U.S. New Auto and Truck Sales	Millions	14.5	14.9	13.8	14.8	15.9	3.3	-7.7	7.4	7.2
U.S. Housing Starts	Millions	1.4	1.6	1.6	1.2	1.3	15.1	-3.1	-23.9	5.8
U.S. Private Residential Investment	Billion Dollars	901	1,108	1,127	988	1,066	23.0	1.7	-12.3	8.0
U.S. Nonresidential Structures	Billion Dollars	614	698	645	735	726	7.6	7.8	9.3	4.3
U.S. Home Price Index (FHFA) 1991Q1 = 100		290	339	386	387	382	16.8	13.8	0.2	-1.2
U.S. Nontaxable & Taxable Retail Sales	Billion Dollars	6,210	7,440	8,125	8,262	8,427	19.8	9.2	1.7	2.0
Utah New Auto and Truck Sales	Thousands	116	129	128	138	149	11.6	-1.2	8.0	7.9
Utah Dwelling Permitted Units	Units	31,757	40,144	30,000	22,750	23,500	26.9	-29.3	-24.2	3.3
Utah Residential Permit Value	Million Dollars	6,330	8,850	7,217	5,300	6,000	39.8	-18.5	-26.6	13.2
Utah Nonresidential Permit Value	Million Dollars	2,508	2,930	3,256	2,800	2,200	16.8	11.1	-14.0	-21.1
Utah Additions, Alterations and Repairs	Million Dollars	1,855	1,835	1,560	1,400	1,300	4.3	-19.9	-9.7	-7.1
Utah Home Price Index (FHFA) 1991Q1 = 100		540	661	793	798	793	22.4	20.0	0.6	-0.6
Utah Taxable Retail Sales	Million Dollars	42,656	49,729	53,610	55,990	58,200	16.6	7.8	4.4	3.9
Utah All Taxable Sales	Million Dollars	74,731	90,105	100,532	103,764	107,770	20.6	11.6	3.2	3.9
DEMOGRAPHICS AND SENTIMENT										
U.S. July 1st Population	Millions	332	332	333	335	337	0.1	0.3	0.6	0.6
U.S. Consumer Sentiment (U of M)	Diffusion Index	81.5	77.6	59.0	63.2	80.0	-4.8	-24.0	7.2	26.5
Utah July 1st Population	Thousands	3,284	3,339	3,381	3,425	3,467	1.7	1.2	1.3	1.2
Utah Net Migration	Thousands	23.6	31.6	18.1	20.3	18.5	33.7	-42.6	11.9	-8.9
PROFITS AND RESOURCE PRICES										
U.S. Corporate Before Tax Profits	Billion Dollars	2,260	2,771	3,017	2,999	3,011	22.6	8.9	-0.6	0.4
West Texas Intermediate Crude Oil	\$ Per Barrel	39.2	68.0	94.8	83.0	80.7	73.2	39.4	-12.4	-2.8
U.S. Coal Producer Price Index 1992 = 100		189	189	280	246	217	0.3	47.7	-11.9	-11.9
Utah Coal Prices	\$ Per Short Ton	37.2	38.4	42.0	40.0	38.0	3.2	9.3	-4.8	-5.0
Utah Oil Prices	\$ Per Barrel	34.9	60.7	81.5	68.0	62.0	74.0	34.2	-16.6	-8.8
Utah Natural Gas Prices	\$ Per MCF	1.96	4.10	7.00	3.30	4.00	109.2	70.7	-52.9	21.2
Utah Copper Prices	\$ Per Pound	2.80	4.25	3.80	3.90	4.00	51.8	-10.6	2.6	2.6
INFLATION AND INTEREST RATES										
U.S. CPI Urban Consumers (BLS) 1982:Q4 = 100		259	271	293	304	311	4.7	8.0	4.0	2.3
U.S. GDP Chained Price Index (BEA) 2012 = 100		114	119	127	131	134	4.5	7.0	3.3	2.4
S&P 500 Index		3,219	4,267	4,011	4,132	4,063	32.6	-3.9	0.8	-1.7
U.S. Federal Funds Rate (FRB)	Effective Rate	0.38	0.08	1.68	4.92	4.37				
U.S. 3-Month Treasury Bills (FRB)	Discount Rate	0.37	0.04	2.02	4.78	4.04				
U.S. 10-Year Treasury Notes (FRB)	Yield (%)	0.89	1.44	2.95	3.59	3.35				
30-Year Mortgage Rate (FRB/MCA)	Percent	3.18	3.03	5.38	6.25	5.61				
EMPLOYMENT AND WAGES										
U.S. Establishment Employment (BLS)	Millions	142.2	146.3	152.6	154.6	153.8	2.9	4.3	1.3	-0.5
U.S. Average Annual Pay (BEA)	Dollars	66,529	70,345	73,076	75,853	79,171	5.7	3.9	3.8	4.4
U.S. Total Wages & Salaries (BEA)	Billion Dollars	9,457	10,290	11,153	11,225	12,176	8.8	8.4	5.1	3.8
Utah Nonagricultural Employment (DWS)	Thousands	1,539	1,616	1,684	1,718	1,747	5.0	4.2	2.1	1.7
Utah Average Annual Pay (DWS)	Dollars	54,079	56,944	61,288	63,667	65,085	5.3	7.6	3.9	2.2
Utah Total Nonagriculture Wages (DWS)	Million Dollars	83,223	92,010	103,180	109,400	113,720	10.6	12.1	6.0	3.9
INCOME AND UNEMPLOYMENT										
U.S. Personal Income (BEA)	Billion Dollars	19,832	21,295	21,733	22,544	23,540	7.4	2.1	4.2	4.4
U.S. Unemployment Rate (BLS)	Percent	8.1	5.4	3.6	3.9	4.6				
Utah Personal Income (BEA)	Million Dollars	171,385	186,991	196,811	206,619	215,899	9.1	5.3	5.0	4.4
Utah Unemployment Rate (DWS)	Percent	4.7	2.7	2.0	2.7	3.4				

Sources: State of Utah Revenue Assumptions Working Group, Moody's Economy.com, and IHS Markit

Focus on the most critical economic variables

3 – Determine Alternative Economic Scenarios

Considerations:

- Consider scenario likelihood given your state's economy
- Do you have a large high-risk industry?
- Cost - what economic scenarios are publicly available for free or can be purchased?
- Economic indicator coverage - how does it compare to your variables under #2?



State Budget Stress Testing User Guide

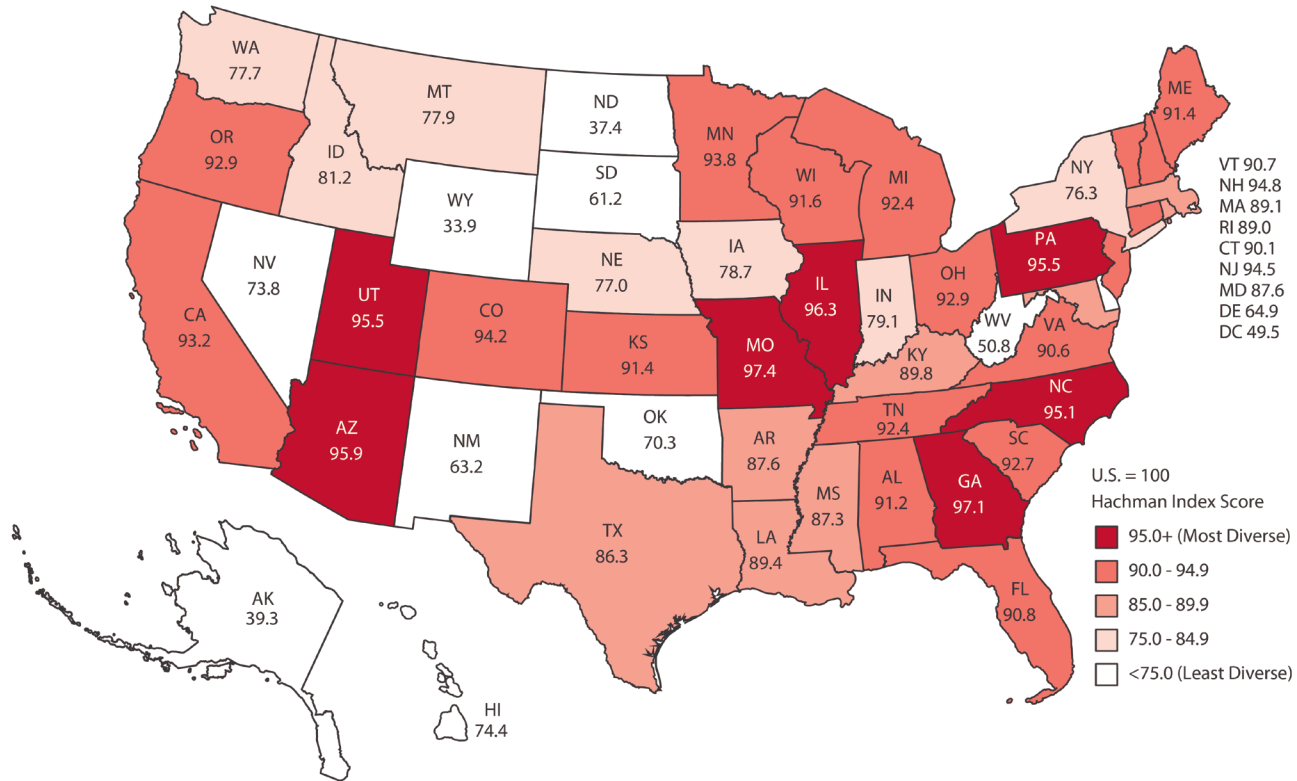
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June 2019

Phil's Takeaway:

- Simpler is better – this is a directional exercise, not a point estimate for budgeting
- Useful to have at least one less severe and one more severe scenario

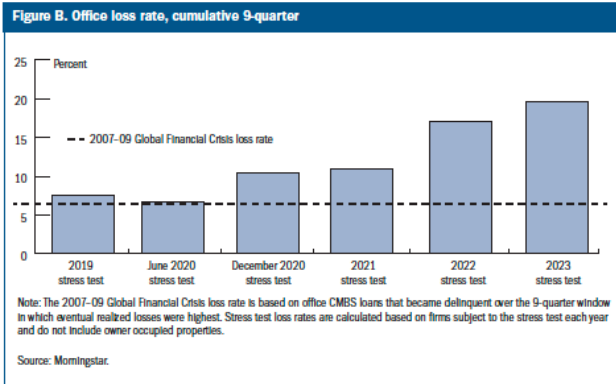
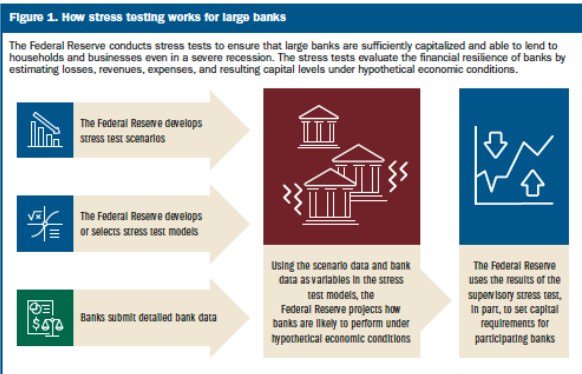
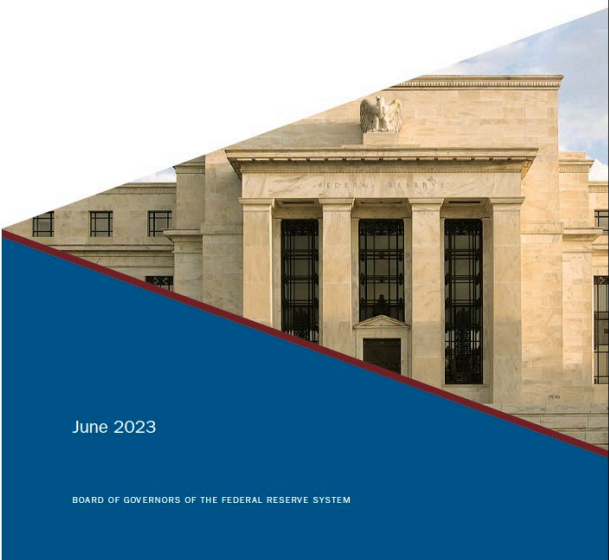
Economic Diversity or Concentration Should Inform Your Scenarios



Federal Reserve Alternative Scenarios are Free, but May Be More Applicable to Some States Than Others



2023 Federal Reserve Stress Test Results



4 – Estimate Revenue and Spending at Risk



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Considerations:

- Model, model, model - Use standard forecasting models to the extent possible given scenario indicators
- Determine baseline (existing budget v. “but for” scenario)
- Forecast alternative scenario
- Compare baseline and alternative

Phil’s Takeaway:

- Simpler is better – don’t let the perfect be the enemy of the good
- Think carefully about baseline for comparison – do you assume spending growth or flat-line?

5 – Inventory and Categorize

Existing Reserves and Other Budget Contingencies

Considerations:

- NOT just the formal rainy day fund
- How did the state handle previous downturns?
- Informal, disaggregated buffers in restricted funds / agency budgets
- Formal / statutory spending relief valves
- Cash-funded infrastructure with ongoing revenue (“working” rainy day funds)
- Revenue increases and spending cuts
- Trust and agency principal balances
- Evaluate option feasibility



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Phil’s Takeaway:

- Think broadly about reserve and budget contingencies – there’s a lot buried in the details of the state budget
- For option feasibility, look at what’s been done previously

6 – Compare Total Reserves & Budget Contingencies to Total Value at Risk



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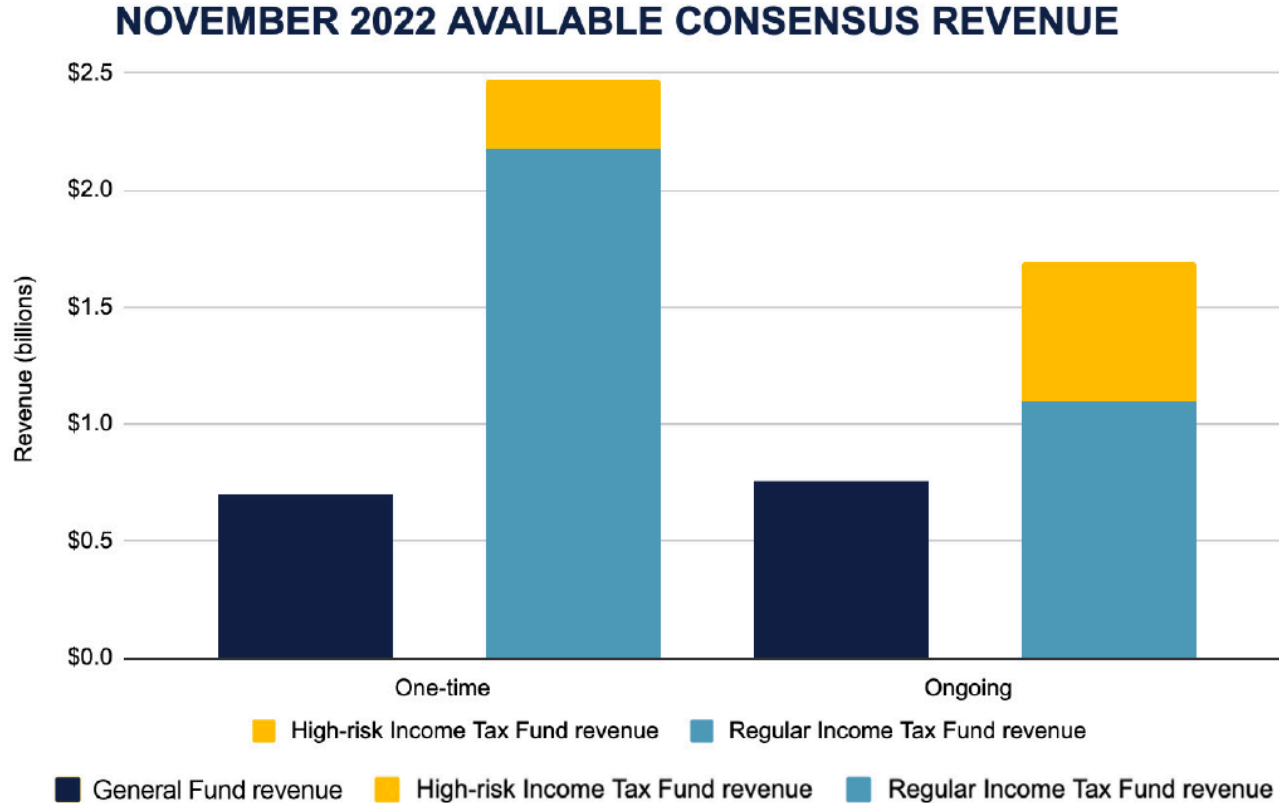
Considerations:

- Pull it all together
- Decide on showing annual or cumulative impacts over the review period

Phil's Takeaway:

- Remember this is directional
- Contemplate level of preparation and think about any needed budget changes
- Consider using preparation level to inform forecast risk assumed – the next frontier in state forecasting??

Utah's Forecast Formally Highlighted Revenue Risk



Source: Utah GOPB

California LAO Shows Forecast Uncertainty

Figure 7

How Likely Is the Budget to Break Even?

General Fund Revenue

The shaded regions show how much revenues might differ from our **main forecast** ●. The **lighter shaded area** shows the most likely range of possibilities barring a recession. The **darker shaded area** shows how far revenues could fall should a recession occur. The **breakeven point** ● shows the amount of revenue needed for the budget to stay balanced without further actions.

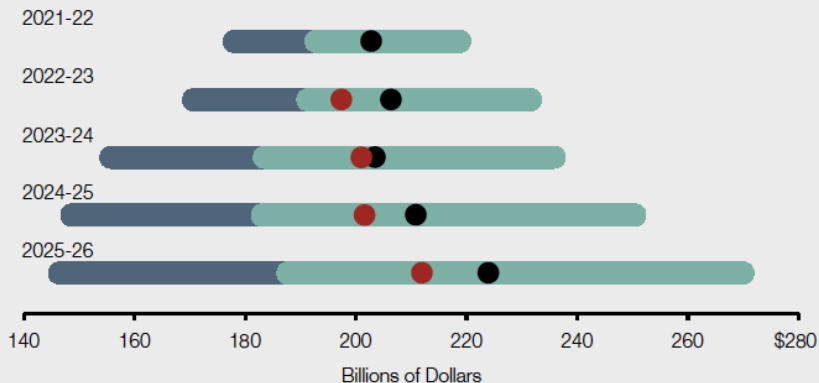
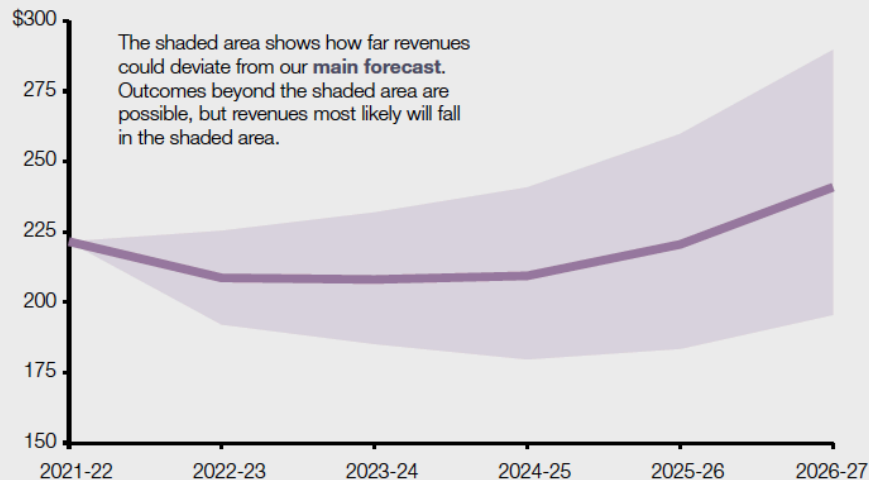


Figure 1

LAO Revenue Outlook

General Fund Revenue, Excluding BSA Transfers (In Billions)



BSA = Budget Stabilization Account.

LAOA

Source: California LAO

7 – Explain It! Concisely Present Findings

Considerations:

- Simple
- Concise
- Doesn't need all the detail (but have it available)
- Make clear this is NOT a forecast of these economic scenarios, but a theoretical exercise



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Phil's Takeaway:

- Plan to dedicate time here – this is one of the most critical steps and could be neglected
- May be the hardest part

Select Forecast Risk Considering Overall Fiscal Health (Strength or Weakness of Other Budget Tools)

STRENGTH OF OTHER BUDGET MANAGEMENT TOOLS

(including revenue stability, reserve accounts, and long-term liabilities)

WEAK

STRONG

EMPLOY VERY LOW-RISK FORECAST

EMPLOY 50-50 FORECAST

States control broad range of budget management tools

- Revenue system design
- Budget reserves
 - Formal rainy day funds
 - Other balances in special/restricted accounts
- Cash flow management
- State spending levels



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