A Dynamic Score of the Proposals in the Budget Blueprint for Fiscal Year 2023

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KEY TAKEAWAYS

The Blueprint's policies are projected to increase GDP by $5.0 trillion over 10 years and by 6.2 percent in the long run.

The Blueprint's policies increase hours worked by 4.2 percent within 10 years, or by 6.0 million full-time equivalent jobs.

The Blueprint's tax cuts and the resulting productivity increases lead to higher wages. After-tax wages increase by 3.5 percent in 10 years.

A government's budget reflects its priorities. Choices about what to tax and what to subsidize follow from legislators' priorities about what to discourage and what to encourage. Taxes, transfer spending, and debt financing reflect distributional concerns about who should bear the costs of government and who should receive additional benefits.[1]

Fiscal choices have profound effects on the economy. Households' and firms' choices about what to buy and sell are affected by how taxes and subsidies distort market prices. Their economic decisions are inseparable from the prevailing fiscal policy.

A plan for fiscal policy that ignores its macroeconomic effects tells an incomplete story. Legislators need the full story about how taxes and spending will affect the economy when planning a budget

for the government. The agencies that produce estimates of the budgetary effects of bills for Congress, the Congressional Budget Office (CBO) and the Joint Committee on Taxation (JCT), will incorporate macroeconomic feedback in their estimates but only for major bills and only upon request. Many ideas that are a part of the larger debate about the budget are not able to receive a complete estimate because of the time and resources needed for CBO and JCT to model macroeconomic effects.

This *Issue Brief* produces similar estimates for the proposals in The Heritage Foundation's Budget Blueprint for Fiscal Year 2023. The Budget Blueprint is a plan to reduce the economic distortion of taxation and bring spending in line with tax revenue. By producing a dynamic score of the Blueprint, Heritage hopes to add new information to the debate as legislators consider bills with fiscal effects.

The results presented here use a computable general equilibrium (CGE) model under development within Heritage's Center for Data Analysis. In this CGE model, households, firms, and governments participate in markets. Households and firms trade to maximize utility and profit, respectively. Their supply and demand curves are the solutions to forward-looking optimization problems, which means they respond to current and future changes in policy. Government policy, such as the current law baseline or the Budget Blueprint, is an input into the model. The model's output is a solution for wages and interest rates that clear markets in equilibrium along a balanced growth path. More details and a brief description of the solution procedure are presented at the end of this *Issue Brief*.

Economic Principles to Create a Larger Economy

The goal for fiscal policy should be to maximize gains from trade, letting as many people improve their lives as possible. A market without taxes achieves this goal, reaching an equilibrium when the cost to produce a good equals the value of the good to the consumer.

Taxes distort economic decisions. Households and firms try to reduce the cost of taxes by buying or producing less of a taxed good. The tax creates a wedge between the price paid by a consumer and the price received by a producer. Any trade that does not produce surplus value greater than the tax wedge never occurs. Thus, the costs from taxation for society include not just the tax revenue paid to the government but foregone value from trades that never occur.

Keeping taxes low reduces economic distortion. Some level of taxation is unavoidably necessary, but ideally the government would raise revenue in the least distorting way by collecting small rates on a large base.

When there is more trade because of lower taxes, there is a bigger tax base for the government to raise revenue. For example, the Blueprint proposes adopting neutral cost recovery for structures and reducing the corporate income tax rate as specific taxes that should be reduced. The reduction of taxes on capital are responsible for most of the increase in output. Lower tax rates start a chain of cascading economic developments:

- Lower taxes on capital income increase the returns to saving and investment.

- Firms want to invest more and households are willing to save to finance the investment.

- With the additional capital, firms produce more goods and services.

- Households incomes increase as the value of what capital and labor produce increase.

- Consumption increases as more goods and services are produced.

- Federal tax revenues increase, because revenue is proportional to incomes and production.

Effects in the 10-Year Budget Window

Table 1 shows revenues, outlays, surpluses, debt, and gross domestic product (GDP) under model equivalents[2] of the CBO baseline and the Blueprint's proposals. The static estimate is calculated by applying the proposed policies to economic tax bases from the baseline. The dynamic estimate allows labor and capital markets to find a new equilibrium and calculates budget figures using the updated bases. Using model equivalents puts the different estimates on equal terms, allowing an apples-to-apples comparison of the static and dynamic effects, which are reported in the bottom half of Table 1.

The reduction in tax rates provides incentives for households to work and firms to invest. The reduction in income tax raises after-tax wages,

TABLE 1

Budget Figures for Blueprint and Baseline

		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2023–2032
Baseline	Revenues	4,910	4,955	5,002	5,285	5,558	5,720	5,932	6,152	6,385	6,638	56,537
	Outlays	5,826	6,039	6,222	6,536	6,860	7,299	7,694	8,096	8,495	8,946	72,012
	Surplus/Deficit	-915	-1,084	-1,220	-1,252	-1,302	-1,579	-1,762	-1,944	-2,110	-2,308	-15,475
	Debt Held by Public	24,762	25,973	27,325	28,715	30,158	31,884	33,797	35,899	38,171	40,648	—
	GDP	26,185	27,213	28,250	29,340	30,469	31,629	32,842	34,102	35,415	36,788	312,233
	Debt-to-GDP Ratio (%)	95	95	97	98	99	101	103	105	108	110	—
"Static" Blueprint	Revenues	4,857	4,891	4,912	4,965	5,222	5,378	5,587	5,800	6,023	6,265	53,899
	Outlays	5,337	5,417	5,220	5,358	5,488	5,644	5,986	6,058	6,185	6,332	57,025
	Surplus/Deficit	-481	-526	-308	-392	-266	-266	-399	-258	-162	-67	-3,126
	Debt Held by Public	24,296	24,947	25,370	25,877	26,264	26,655	27,192	27,600	27,924	28,167	—
	GDP	26,185	27,213	28,250	29,340	30,469	31,629	32,842	34,102	35,415	36,788	312,233
	Debt-to-GDP Ratio (%)	93	92	90	88	86	84	83	81	79	77	—
Blueprint	Revenues	4,837	4,939	4,968	5,025	5,284	5,445	5,662	5,882	6,112	6,361	54,515
	Outlays	5,308	5,447	5,246	5,384	5,505	5,644	5,977	6,042	6,163	6,305	57,021
	Surplus/Deficit	-471	-508	-278	-359	-221	-200	-315	-160	-51	56	-2,506
	Debt Held by Public	24,317	24,953	25,364	25,861	26,225	26,573	27,042	27,362	27,579	27,695	—
	GDP	26,243	27,359	28,496	29,676	30,902	32,164	33,485	34,858	36,288	37,777	317,248
	Debt-to-GDP Ratio (%)	93	91	89	87	85	83	81	78	76	73	—
Static Difference	Revenues	-54	-64	-90	-320	-336	-342	-345	-352	-363	-374	-2,638
	Outlays	-488	-622	-1,002	-1,179	-1,372	-1,655	-1,708	-2,038	-2,310	-2,614	-14,988
	Surplus/Deficit	434	558	912	859	1,036	1,313	1,363	1,686	1,947	2,241	12,350
	Debt Held by Public	-466	-1,026	-1,955	-2,838	-3,894	-5,229	-6,605	-8,299	-10,247	-12,481	—
	GDP	—	—	—	—	—	—	—	—	—	—	—
	Debt-to-GDP Ratio (%)	-2	-4	-7	-10	-13	-17	-20	-24	-29	-34	—
Dynamic Effects	Revenues	-19	48	55	60	62	66	75	82	89	97	616
	Outlays	-30	30	26	27	17	0	-8	-16	-22	-27	-4
	Surplus/Deficit	10	18	29	33	45	66	84	98	112	124	620
	Debt Held by Public	21	6	-6	-16	-39	-82	-150	-238	-345	-472	—
	GDP	58	146	246	336	433	535	643	756	873	989	5,015
	Debt-to-GDP Ratio (%)	0	0	-1	-1	-1	-2	-2	-2	-3	-3	—
Total Effects	Revenues	-73	-16	-34	-259	-274	-276	-270	-270	-273	-277	-2,022
	Outlays	-518	-592	-976	-1,152	-1,355	-1,655	-1,717	-2,054	-2,332	-2,641	-14,992
	Surplus/Deficit	445	576	942	893	1,081	1,379	1,447	1,784	2,059	2,364	12,969
	Debt Held by Public	-445	-1,020	-1,961	-2,854	-3,933	-5,311	-6,755	-8,537	-10,592	-12,953	—
	GDP	58	146	246	336	433	535	643	756	873	989	5,015
	Debt-to-GDP Ratio (%)	-2	-4	-8	-11	-14	-18	-22	-27	-32	-37	—

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NOTE: The static difference is the difference between the static Blueprint and the baseline. The dynamic effects are the difference between the Blueprint and the static Blueprint. The total effects are the difference between the Blueprint and the baseline, which is equal to the sum of the static difference and the dynamic effects.
SOURCE: Heritage Foundation calculations. Baseline numbers are based on data from Congressional Budget Office, "The Budget and Economic Outlook: 2022 to 2032," May 25, 2022, https://www.cbo.gov/publication/57950 (accessed July 14, 2022). For more information, see "Model Description" in the text.

leading to an increase in hours worked. After-tax wages increase by 3.5 percent and hours worked increase by 4.2 percent at the end of the 10-year budget window. For reference, that is equivalent to $2,200 for the median household and 6.0 million full-time equivalent jobs.[3] Additional investment increases the capital stock by 2.9 percent after 10 years. The additional labor and capital results in increased GDP. At the end of the 10-year budget window, GDP is 2.7 percent higher than in the baseline.

The increase in GDP raises projected revenues relative to traditional estimates. As economic activity increases, the government takes a smaller share of a bigger pie. While macroeconomic effects indicate that revenue would be higher than what a traditional estimate would suggest, the net result of lower tax rates is a reduction in revenue.

Over the 10-year window, the increase in revenue from dynamic effects is about 23 percent of the static reduction. The relatively small effect in the budget window is because dynamic effects operate through capital accumulation, which occurs over time and continues outside the budget window. Over the first 25 years, dynamic effects recover about 39 percent of the static cut. The dynamic effects on revenues are in line with general estimates reported elsewhere in the literature.[4]

The increase in GDP is due to increased activity in financial markets. Under the Blueprint, reduced tax rates mean that firms increase investment and look to borrow more to finance it. For a given amount of savings from households, when more of it is used to finance private investment, there is less available for the government to finance its budget deficit. Thus, the government must pay higher interest rates to secure a share of the more limited funding.

The Blueprint reverses the standard story about crowding out in financial markets. The standard story to illustrate crowding out considers an increase in government spending financed by issuing new debt. For a given amount of savings from households, when more of it is used to purchase government debt, there is less available for firms to finance investment in capital. Firms with particularly productive investment projects bid up interest rates to secure a share of the more limited funding.

Therefore, macroeconomic effects raise outlays relative to a traditional estimate. While the Budget Blueprint would significantly reduce total outlays using both traditional and dynamic estimates, the reduction in outlays is less when incorporating the macroeconomic effects because of increased interest rates on federal debt. This insight highlights the importance of understanding why prices change. Though the increase in interest raises interest costs for the federal government, it is worth the benefits of increased investment.

TABLE 2

Changes in Key Economic Indicators

	Year 10 Change	Long-Run Change
Output	+2.69%	+6.18%
Consumption	+4.00%	+8.23%
Investment	+7.70%	+12.92%
Capital stock	+2.86%	+8.08%
Labor hours	+4.19%	+5.24%
Wages	−1.20%	+1.42%
After-tax wages	+3.50%	+6.25%

SOURCE: Heritage Foundation calculations. For more information, see "Model Description" in the text.

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Under both the static and dynamic estimates of the Blueprint, debt held by the public falls relative to GDP. While debt held by the public in 2032 is about $40 trillion in the baseline, it is about $28 trillion under the Blueprint. The debt falls primarily because large reductions in outlays reduce the deficit relative to the baseline.

Accounting for dynamic effects reduces the estimate of the debt in 2032 by about $475 billion. The additional reduction and debt and the increase in GDP imply that the ratio of debt to GDP falls to 73 percent instead of 77 percent.

The Budget Blueprint Produces Long-Lasting Growth

A key feature of the model is adjustment costs when firms change the capital stock. Adjustment costs are needed for the model to match data regarding the pace of investment in response to policy changes. As a result, capital accumulates slowly over time as firms build up toward the higher equilibrium capital stock. Revenues grow over time as firms invest in capital and increase output.

Indeed, the beneficial effects of the Blueprint's policies continue well after the 10-year budget window. Adjustment costs mean that the capital stock takes many years to converge to the new equilibrium growth path, raising growth rates well into the future. Due to the increases in investment and labor, real GDP growth is elevated by at least 0.20 percent per year for the first 10 years, by at least 0.10 percent per year for the first 17 years, and by at least 0.05 percent per year for the first 33 years.

In the new equilibrium, GDP is 6.18 percent higher than in the baseline. Much of the increase occurs outside the 10-year budget window. Consumption, investment, capital, labor, and wages are all higher in the long-run equilibrium than at the tenth year. The 4.00 percent increase in consumption corresponds to $678 billion per year, or $5,300 per year per household.[5] The 5.24 percent increase in hours corresponds to 7.2 million full-time equivalent jobs with the current population.[6]

A Bigger Economy in the Big Picture

The model used to produce these estimates is substantially simpler than what the CBO uses to produce its baseline and score legislation.[7] Heritage's model is based on a neoclassical growth model with additional detail added to capture relevant aspects for reporting budget figures. The results are presented in a format familiar to legislators that is easily compared to CBO's estimates.

Lawmakers should keep the key insights of the model in mind when considering fiscal legislation, including appropriations bills, for FY2023. Cuts in tax rates and adjustments to the tax base will produce long-lasting economic growth. Macroeconomic effects raise revenue through higher output but not enough so that tax cuts pay for themselves. Tax cuts should be paired with spending cuts. Major spending cuts can put debt on a sustainable path.

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Appendix: Model Description

The model used to produce these estimates has only minor changes from the model used for the FY2022 estimates earlier this year.[8] The updated model includes additional detail for smaller budget line items and for converting figures in the National Income and Product Accounts to match definitions in the federal budget. The baseline was updated to reflect the most recent CBO publication in May.[9] The following paragraphs reproduce the model description printed in the dynamic estimates of the FY2022 Blueprint with additional exposition for clarity.

The economic model used in this paper is a computable general equilibrium (CGE) model developed with reference to Zodorow and Diamond (2013)[10] and Heer and Maussner (2009).[11] The references are handbook and textbook examples for the general class of CGE model, which is standard for showing how economies react to changes in policy.

The model has a single representative household with utility that depends on consumption of a single composite good and leisure. The representative household spends on the consumption good, purchases of equity stakes in firms, and purchases of debt issued by governments. Its income comes from providing labor to firms and governments at market wages, receiving dividends from firms' earnings, receiving interest from government debt, and receiving transfer payments from governments. Given its budget, the household chooses consumption, labor hours, purchases of equity, and purchases of debt in order to maximize its lifetime utility.

There are two types of firms: corporate and non-corporate. Firms choose to hire labor and choose an investment plan to maximize the value of the firm to existing shareholders. Firms are assumed to pay a constant fraction of their earnings as dividends. They issue equity to cover the cost of investment above and beyond retained earnings. Additionally, corporate firms are subject to the corporate tax rate, while non-corporate firms are not.

In order to change the capital stock, firms must face adjustment costs through forgone output (such as needing to shut down a factory in order to install upgraded machinery). The presence of adjustment costs means that firms make changes to the capital stock more slowly than if adjustment costs were absent.

There are two governments in the model: the federal government and the combined state and local governments. Both governments raise revenue by levying seven types of taxes: taxes on wages, capital gains, dividends, interest, and corporate income plus payroll taxes for social benefits, and sales taxes on produced output. They spend money on purchases of the consumption

good and lump-sum transfer payments to households. Value added by the governments is assumed to be a constant proportion of spending on the consumption good by governments, which raises real output, all else equal.

The model treats marginal and average tax rates separately. Marginal rates are taken directly from policy or taken as a dollar-weighted average of marginal rates when taxes have graduated brackets. Average tax rates are calibrated so that the model matches observed revenues relative to output when applied to tax bases calculated from the model.

The model is solved using the extended path method of Fair and Taylor (1983).[12] Agents are presumed to have perfect foresight over future policy. They solve for the equilibrium variables over a transition path ending at the long-run steady state. The estimates presented here consider a transition path of 150 years at an annual frequency.

The federal government must have a stable debt-to-output ratio in the long-run equilibrium. Since the proposed 10-year budget plans do not produce the necessary surpluses, nor does current law within the next 30 years, the model presumes that efforts to stabilize the debt start after 30 years. The government sets a target debt-to-output ratio and reduces the excess debt by 1 percent per year by reducing transfer payments to households.

Endnotes

1. For more background, see Athreya, Kartik B., 2014. *Big Ideas in Macroeconomics: A Nontechnical View*, MIT Press Books, The MIT Press, edition 1, volume 1. Chapter 3, "Macroeconomists, Efficiency, and Inequality" contains a good overview of macroeconomic concepts relevant for policy makers.

2. The methodology used in this model is not the same as what CBO uses to produce its baseline. Equations of the model provide constraints on equilibrium conditions that make it difficult to reproduce the CBO numbers exactly. The baseline figures here track closely with CBO's numbers along many dimensions.

3. Calculated using a median post-tax household income of $62,773, as reported in U.S. Census Bureau, *Income and Poverty in the United States: 2020*, September 14, 2021, https://www.census.gov/library/publications/2021/demo/p60-273.html (accessed July 16, 2022).

4. For an estimate of the dynamic effects in a textbook version of the neoclassical growth model, see Mankiw, N. Gregory & Weinzierl, Matthew, 2006. "Dynamic scoring: A back-of-the-envelope guide," Journal of Public Economics, Elsevier, vol. 90(8-9), pages 1415-1433, September.

5. U.S. Bureau of Economic Analysis, "Personal Consumption Expenditures (PCE),"Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series /PCE (retrieved July 15, 2022); and U.S. Census Bureau, "Total Households (TTLHH)," Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org /series/TTLHH (retrieved July 14, 2022).

6. The number of additional full-time equivalent jobs will increase with population along the equilibrium growth path.

7. The model is similar to the CBO's Policy Growth Model or JCT's Macroeconomic Equilibrium Growth (MEG) Model.

8. Parker Sheppard, "A Dynamic Score of the Proposals in the Budget Blueprint for Fiscal Year 2022," Heritage Foundation *Issue Brief* No. 5255, March 14, 2022, https://www.heritage.org/budget-and-spending/report/dynamic-score-the-proposals-the-budget-blueprint-fiscal-year-2022.

9. CBO, *The Budget and Economic Outlook: 2022 to 2032*, May 25, 2022, https://www.cbo.gov/publication/57950 (accessed July 14, 2022).

10. George R. Zodrow and John W. Diamond, "Dynamic Overlapping Generations Computable General Equilibrium Models and the Analysis of Tax Policy: The Diamond–Zodrow Model," in Peter B. Dixon and Dale Jorgenson (eds.), *Handbook of Computable General Equilibrium Modeling*, Vol. 1 (Amsterdam: Elsevier, 2012), pp. 743–813.

11. Burkhard Heer and Alfred Maussner, *Dynamic General Equilibrium Modeling* (Springer Books, 2009).

12. Ray Fair and John Taylor, "Solution and Maximum Likelihood Estimation of Dynamic Nonlinear Rational Expectations Models," *Econometrica*, Vol. 51, No. 4 (1983), pp. 1169–85.