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Dynamic Analysis at CBO

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For additional information, see Congressional Budget Office, "Dynamic Analysis," www.cbo.gov/topics/dynamic-analysis.

Overview

- New requirement for dynamic scoring
- CBO's approach to dynamic analysis
- Case study: A dynamic estimate of repealing the Affordable Care Act

The New Requirement for Dynamic Scoring

Main Points

- Conventional cost estimates already incorporate behavioral responses but not changes in broad economic variables.
- The requirement to estimate the budgetary feedback of macroeconomic effects applies to major legislation.
- CBO has estimated the budgetary feedback of macroeconomic effects but generally not for cost estimates for legislation.

Behavioral Responses Addressed in Conventional Cost Estimates

- If proposed policies would affect people's behavior in ways that would affect the budget, those effects are incorporated in CBO's conventional estimates.
- By long-standing convention, CBO's cost estimates generally have not reflected changes in behavior that would affect total output in the economy, such as any changes in labor supply or private investment resulting from changes in fiscal policy.

How CBO Complies With the 2016 Budget Resolution

- To the greatest extent practicable, CBO and the staff of the Joint Committee on Taxation (JCT) incorporate the budgetary effects of changes in macroeconomic variables resulting from legislation with one of two characteristics.
  - Has a gross budgetary effect of 0.25 percent of GDP (excluding macroeconomic feedback) in any year over the next 10 years (an amount equal to about $47 billion in 2016)
  - Is designated by one of the Chairmen of the Budget Committees
- CBO and JCT compute the gross budgetary effect by summing the absolute values of the budgetary effects of the provisions and their interactions.

How CBO Complies With the 2016 Budget Resolution (Continued)

- Estimates also include a qualitative assessment of the budgetary effects (including macroeconomic effects) for the subsequent 20-year period.
- Appropriation acts are excluded.
- CBO and JCT coordinate on legislation that significantly affects both spending and tax policies.

The New Requirement Extends Previous Analyses by CBO

- CBO has routinely produced estimates of the macroeconomic effects of fiscal policies and of the feedback from those macroeconomic changes to the federal budget.
  - Analysis of the President's budget
  - Annual long-term budget and economic outlook
  - Analyses of illustrative fiscal policy scenarios
- CBO has generally not produced such estimates for specific legislation prior to the 2016 budget resolution (one exception, in 2013, was S. 744, the Border Security, Economic Opportunity, and Immigration Modernization Act).

The New Requirement Extends Previous Analyses by CBO (Continued)

- Because S. 744 would have significantly increased the size of the U.S. labor force, CBO and JCT incorporated in the cost estimate their projections of the direct effects of the act on the U.S. population, employment, and taxable compensation.
- CBO separately published an analysis of additional economic effects and their feedback to the budget.

Some Recent Dynamic Analysis by CBO

- Proposal to repeal the Affordable Care Act (June 2015)
- Restoring Americans' Healthcare Freedom Reconciliation Act of 2015 (multiple estimates, October-December, 2015)

CBO's Approach to Dynamic Analysis

CBO's Approach to Analyzing Economic Effects of Fiscal Policies

- Short term: Changes in fiscal policies affect the overall economy primarily by influencing the demand for goods and services, which leads to changes in output relative to potential (maximum sustainable) output.
- Long term: Changes in fiscal policies affect output primarily by altering national saving, foreign investment in the U.S., federal investment, and people's incentives to work and save, as well as businesses' incentives to invest—thereby changing potential output.

Central Estimates and Ranges

- CBO's estimates of effects are based on parameters such as the extent to which national saving is altered by changes in fiscal policies.
- In most cases, CBO estimates economic effects (and feedback to the budget) using a range of parameter estimates reflecting the consensus in the economic literature.
- To arrive at its estimate of the economic effects, CBO uses the central estimates for those parameters.

Short-Term Effects From Changes in Demand

- Changes in purchases by federal agencies and by those who receive federal payments and pay taxes directly contribute to aggregate demand.
- The change in output for each dollar of direct contribution to demand (the “demand multiplier”) varies with the response of monetary policy.

Short-Term Effects From Changes in Demand: CBO's Estimates of the Demand Multiplier

- When the monetary policy response is likely to be limited, the demand multiplier over four quarters ranges from 0.5 to 2.5, with a central estimate of 1.5.
- When the monetary policy response is likely to be stronger, the demand multiplier over four quarters ranges from 0.4 to 1.9, with a central estimate of 1.2; over eight quarters, it ranges from 0.2 to 0.8, with a central estimate of 0.5.

Short-Term Effects From Changes in Labor Supply

- Effects on the supply of labor lead to changes in employment, depending on the amount of slack in the labor market.

Long-Term Effects

- CBO uses two models of potential output to estimate the effects of changes in fiscal policies on the overall economy over the long term.
  - Solow-type growth model
  - Life-cycle growth model
- Potential output depends on three major factors.
  - Amount and quality of labor and capital (which depend on work, saving, and investment)
  - Productivity of the labor and capital inputs (which depends in part on federal investment)
  - Amount of national saving (which depends in part on federal borrowing)

The Role of Expectations About Fiscal Policy: Solow-Type Growth Model

- People base their decisions about working and saving primarily on current economic conditions, including government policies.
- Decisions reflect people's anticipation of future policies in a general way but not their responses to specific future developments.

The Role of Expectations About Fiscal Policy: Life-Cycle Growth Model

- People make choices about working and saving in response to both current economic conditions and their explicit expectations of future economic conditions.
- The model requires specification of future fiscal policies that put federal debt on a sustainable path over the long run because forward-looking households would not hold government bonds if the households expected that debt as a percentage of GDP would rise without limit.

How Labor Supply Responds to Changes in Fiscal Policy in the Solow-Type Growth Model

- The overall effects of a policy change on the labor supply can be expressed as an elasticity, which is the percentage change in the labor supply resulting from a 1 percent change in after-tax income.
  - Substitution effect: Increased after-tax compensation for an additional hour of work makes work more valuable relative to other uses of a person's time.
  - Income effect: Increased after-tax income from a given amount of work allows people to maintain the same standard of living while working fewer hours.

How Labor Supply Responds to Changes in Fiscal Policy in the Solow-Type Growth Model (Continued)

- CBO's central estimate corresponds to an earnings-weighted total wage elasticity for all earners of 0.19 (composed of a substitution elasticity of 0.24 and an income elasticity of -0.05).
- For some proposals, income and substitution effects may not offset each other (for example, if the proposal would increase after-tax wages but reduce income).
- CBO estimates that the substitution elasticity could range from a low estimate of about 0.16 to a high estimate of about 0.32; the income elasticity could range from about -0.10 to about 0.

Other Key Aspects of the Solow-Type Growth Model

- When the deficit increases by one dollar, private saving is estimated to rise by 43 cents (national saving falls by 57 cents), and net capital inflows rise by 24 cents, ultimately leaving a decline of 33 cents in investment.
  - Range of estimates: The decline in investment ranges from 15 cents to 50 cents
- Additional federal investment is estimated to yield half of the typical return on investment completed by the private sector.
  - The range of estimates goes from no return on investment to the typical return on investment completed by the private sector.

Key Aspects of the Life-Cycle Growth Model

- Labor supply and private saving are influenced by the current values and future anticipated values of the after-tax rate of return on saving, the after-tax wage, and households' disposable income, among other factors.
- The elasticity with respect to a one-time temporary change in wages (the so-called Frisch elasticity) is 0.40, according to CBO's central estimates, with a range from 0.27 to 0.53.
  - Frisch elasticity is calibrated to be consistent with CBO's estimate of the total wage elasticity.
- Because of the uncertainty that households face about their future income, households in the life-cycle growth model take the precaution of holding additional savings as a buffer against potential drops in income.

Range of Estimates Within the Life-Cycle Growth Model

- Results are shown assuming a small open economy (in which wages and interest rates are determined by world markets) and assuming a closed economy (in which wages and interest rates are determined domestically).
- Because the model is forward-looking, it requires offsetting policy changes that stabilize government debt.
- Different specifications of future fiscal policies put federal debt on a sustainable path; beginning in 15 years, those policies are assumed to phase in over 10 years.
  - Reduced spending (half from government purchases and half from transfers)
  - Increased taxes (half from marginal rate changes and half in lump-sum amounts)
  - Both of those closure rules are reported, and results generally are similar

Uncertainty in Budgetary Outcomes

- When practicable and informative, CBO will report the estimated range of budgetary outcomes owing to the uncertainty of macroeconomic effects.
- Whether that range is informative depends in part on CBO's assessment of the uncertainty of the estimated feedback relative to the uncertainty of the conventional cost estimate.

How CBO Reported the Range of Macroeconomic Estimates in the Analysis of the President's 2016 Budget

- In its analysis of the President's budget, CBO reported the range of Solow-type growth model estimates.
- Differences between Solow model and life-cycle model results reflect model uncertainty rather than parameter uncertainty; those differences complicate interpretation.

How CBO Reported the Range of Macroeconomic Estimates in the Analysis of the President's 2016 Budget (Continued)

- The likelihood that all parameters would simultaneously be at the ends of their ranges is smaller than the likelihood that any single parameter would be at the end of its range.
  - CBO focused on uncertainty about the two parameters that had the largest budgetary effects.
  - CBO examined estimates resulting from cases in which two parameters were at the ends of their ranges and other parameters were equal to central estimates.
- The agency reported cases that showed the most favorable and least favorable budgetary outcomes.

Presentation of Macroeconomic Analyses in Cost Estimates

- Presentation will probably evolve over time as CBO learns what is most useful.
- Estimates show all of the information that traditionally would be included if macroeconomic effects were not incorporated and identify the macroeconomic effects separately.
- Estimates provide information related to the uncertainty of the macroeconomic effects.

Case Study: A Dynamic Estimate of Repealing the Affordable Care Act

CBO's Analysis of Repealing the Affordable Care Act

- At the request of the Chairman of the Senate Budget Committee, CBO and JCT analyzed the budgetary cost of repealing the ACA, including macroeconomic feedback.
- With that feedback, CBO and JCT estimate that repealing the ACA would increase federal budget deficits by $137 billion over the 2016–2025 period.
  - Excluding feedback, deficits would increase by $353 billion.
  - Feedback reduces projected deficits by $216 billion.

CBO's Analysis of Repealing the Affordable Care Act (Continued)

- Over the 2026–2035 period, repealing the ACA would increase deficits, with or without macroeconomic effects, CBO and JCT estimate.
- The estimates include a high degree of uncertainty.
  - Over the 2016–2025 period, repeal could reduce deficits or increase them by much more than estimated.
  - Over the 2026–2035 period, repeal would probably not reduce deficits, even given great uncertainty.
- ACA repeal would cause large and partially offsetting changes to spending and revenues.

Effects of Repeal of the Affordable Care Act on Labor Markets: The Six Most Significant Provisions

- Subsidies that phase out with increasing income would be eliminated, raising work incentives and therefore labor supply.
- Eliminating subsidies and the Medicaid expansion would reduce people's available resources, increasing labor supply.
- Repealing provisions that lower the cost of health insurance plans offered to older workers outside the workplace would cause some workers to delay retirement, increasing labor supply.

Effects of Repeal of the Affordable Care Act on Labor Markets: The Six Most Significant Provisions (Continued)

- Eliminating exchange subsidies would decrease the incentive to work for many low-income people because of interactions with Medicaid eligibility requirements, reducing labor supply.
- Employer mandate would be eliminated, raising labor demand in the short run and labor supply in the long run as wages adjust.
- Increased HI payroll tax for high earners and high-premium excise tax would be eliminated, increasing work incentives and therefore labor supply.

Estimated Effects of Repeal of the Affordable Care Act on Labor Markets

- Overall, repeal of the ACA is estimated to increase aggregate hours worked by about 1.5 percent between 2021 and 2025.
  - Previous estimate was about 1.5 percent to 2 percent
- That increase in hours translates into an increase in aggregate compensation of between 0.8 percent and 0.9 percent over the same period.
  - Previous estimate was about 1 percent
- Hours worked would rise by more than compensation because lower-wage workers would be most strongly affected by the repeal, so they would change labor supply the most.

Other Macroeconomic Effects of Repealing the Affordable Care Act

- Aggregate demand would be slightly lower in the short run.
  - Redistribution from lower-income benefit recipients to higher-income taxpayers and medical care providers
- Larger labor supply would lead to increased investment and a larger capital stock.
  - Effect offset somewhat by increased deficits, which crowd out capital
  - Longer-term effects estimated with the Solow-type growth model
- Output would be roughly unchanged in 2016 but higher in later years.
- Interest rates would be higher.
  - Capital-labor ratio would fall with larger labor supply, increasing the marginal product of capital and therefore interest rates

Macroeconomic Feedback Effects of Repealing the Affordable Care Act

- Higher output would increase revenues and modestly increase primary spending.
  - Revenues depend on taxable income of different types with different effective marginal tax rates.
  - Outlays depend more on prices than real output.
- Higher interest rates would increase federal interest payments on the national debt.
- Feedback effects would lower deficits throughout the 2016–2025 period.

Macroeconomic Feedback Effects of Repealing the Affordable Care Act (Continued)

- Feedback effects would increase for some time because the effects of the ACA, and therefore repeal, phase in over time but feedback effects would ultimately decline as the effects of higher deficits became more important.
- In CBO's analyses of other policies, macroeconomic feedback has been less significant relative to the estimated cost without macroeconomic feedback.

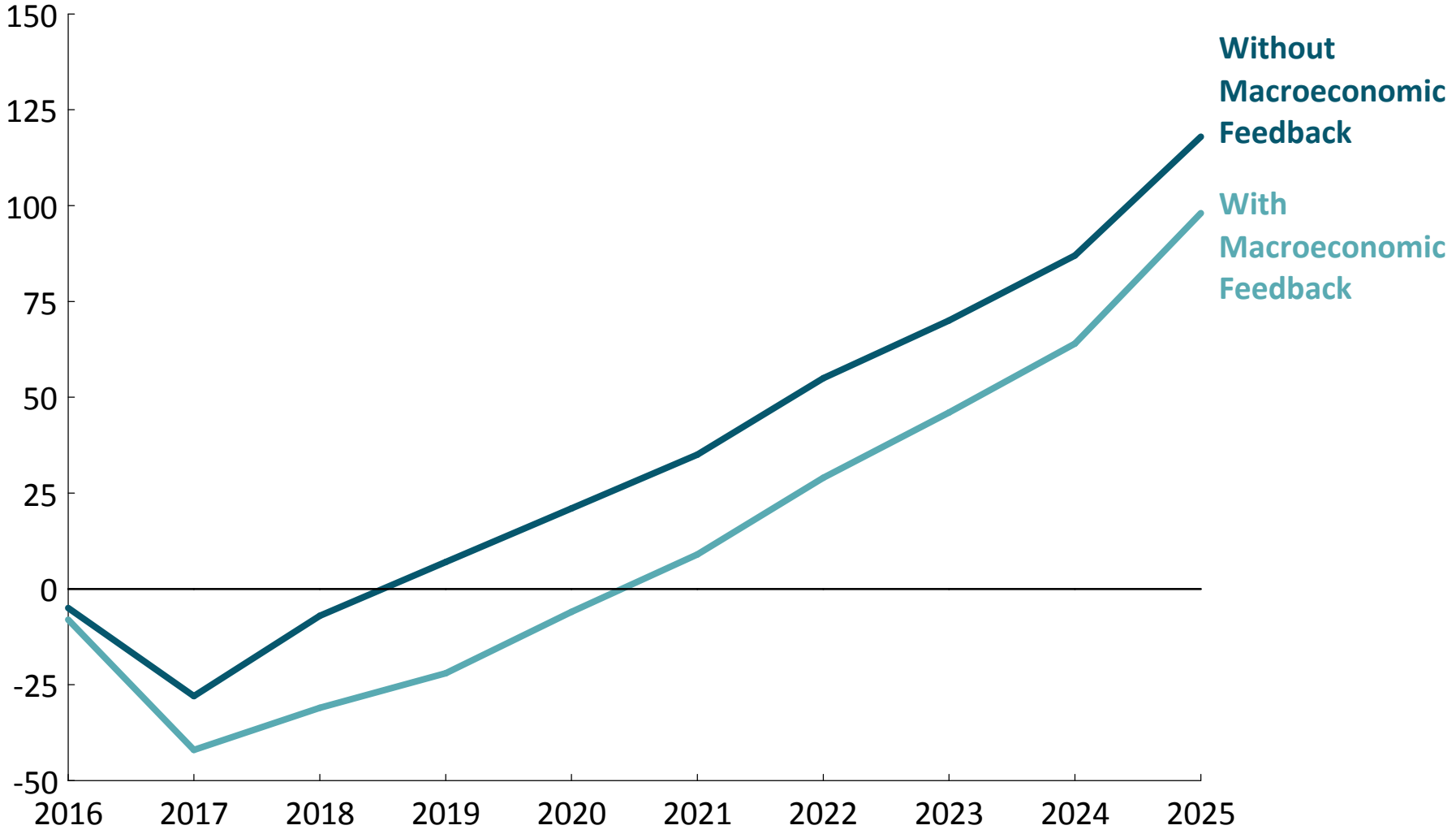
Summary of Estimated Effects on Direct Spending and Revenues of Repealing the Affordable Care Act

Billions of Dollars, by Fiscal Year

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total, 2016–2020	Total, 2016–2025
Estimated Changes Without Macroeconomic Feedback												
Effects on Outlays	-10	-107	-106	-100	-93	-88	-77	-71	-65	-43	-477	-821
Effects on Revenues	-66	-79	-99	-107	-115	-123	-132	-142	-152	-161	-466	-1,174
Effects on the Deficit	-5	-28	-7	7	21	35	55	70	87	118	-12	353
Estimated Budgetary Impact of Macroeconomic Feedback												
Effects on Outlays	*	-2	-3	-2	-1	1	2	4	5	6	-8	9
Effects on Revenues	3	11	21	26	27	27	28	28	27	26	88	255
Effects on the Deficit	-4	-13	-24	-29	-28	-26	-26	-24	-23	-20	-97	-216
Estimated Changes With Macroeconomic Feedback												
Effects on Outlays	-71	-109	-109	-103	-94	-87	-75	-68	-60	-37	-486	-812
Effects on Revenues	-63	-67	-78	-81	-88	-96	-104	-114	-124	-135	-377	-949
Effects on the Deficit	-8	-42	-31	-22	-6	9	29	46	64	98	-108	137

Estimated Effects on Deficits of Repealing the Affordable Care Act

Billions of Dollars, by Fiscal Year



Notes

For more information about CBO's analysis of the Affordable Care Act under current law and the effects of proposals to change the law, see the following:

- Congressional Budget Office, "Affordable Care Act," www.cbo.gov/topics/health-care/affordable-care-act.
- Congressional Budget Office, *Budgetary and Economic Effects of Repealing the Affordable Care Act* (June 2015), www.cbo.gov/publication/50252.
- Edward Harris and Shannon Mok, *How CBO Estimates the Effects of the Affordable Care Act on the Labor Market*, Working Paper 2015-09 (Congressional Budget Office, December 7, 2015), www.cbo.gov/publication/51065.