the budget lab

Types of Budget Estimates

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Model documentation

Summary

1. Static estimates contain no behavioral feedback.
2. Conventional estimates account for certain tax avoidance responses.
3. Dynamic estimates reflect macroeconomic feedback – how policy changes would affect the economy as a whole.
4. Estimates incorporating microeconomic responses fall somewhere between conventional and dynamic, reflecting the budgetary impacts of first-order economic changes.

A budget estimate, often called a "score", refers to the estimated effect of a policy change on the government's finances. For example, if we project that a certain tax increase would raise a total of $100 billion in additional revenues over the coming decade, the budget estimate is said to be $100 billion over ten years. Budget estimates measure the difference in outcomes across two scenarios – the projection under a counterfactual policy reform versus the baseline projection.

The inputs that go into producing a budget estimate depend on the exercise. When analyzing a policy proposal, we may report several kinds of estimates, each which incorporate different types of assumptions based on evidence about how households would respond to the policy change. Below, we describe the different types of estimates we produce and highlight the pros and cons of each.

Static estimates

The simplest type of budget estimate is a *static* or *mechanical* estimate. These estimates do not incorporate any kind of behavioral feedback. For example, imagine a proposal to raise a hypothetical tax rate from 10 percent under current law to 20 percent. If the projected tax base under current law is $10 billion, then the estimate is ($10B x 20%) - ($10B x 10%) = $2B - $1B = $1B of additional revenue raised. In reality, taxpayers may respond by working less or recharacterizing their income to avoid the tax – behavioral responses which would reduce the $10B tax base and thus the revenue estimate. But static estimates only measure the mechanical effects of changing a policy rule. These estimates are largely for illustrative purposes only. As such, we generally do not report static budget estimates.

Conventional estimates

Conventional budget estimates incorporate behavioral feedback that does not reflect broad economic substance. While individual decisions are allowed to change in a conventional estimate, overall economic activity is held fixed across scenarios. In the tax context, these responses can be thought of as tax avoidance behaviors:

- **Recharacterization of legal form.** Pass-through owners might reorganize their businesses as C corporations if the corporate tax rate falls. Investors might move money from brokerage accounts to Roth IRAs if distribution limitations become less restrictive. Pass-through owners might elect to pay state income taxes at the entity level rather than the individual level in the presence of a limit on the Schedule A SALT deduction.
- **Shifting income or spending over time.** Investors might delay realization of capital gains if tax rates rise. Firms may accelerate investments planned for next year into this year if cost recovery rules are scheduled to become less generous.
- **Sectoral reallocation.** Businesses might shift investment spending from “dirty” to “clean” industries in responses to green tax incentives. Commuters might take the bus rather than drive if the gas tax is raised. Households may spend more of their income on charitable donations rather than personal consumption if income tax rates rise.

These responses are largely about minimizing tax liability or maximizing some kind of government benefit given current economic decisions rather than making fundamental changes to those economic decisions. These estimates are the most common type of score produced by government scorekeepers like the Congressional Budget Office, the Joint Committee on Taxation, and Treasury’s Office of Tax Analysis.

Conventional estimates have several major advantages. First, they retain the interpretability and simplicity of static estimates while adding a degree of realism. Second, the kinds of microsimulation models used to produce conventional estimates allow for highly detailed representations of household heterogeneity, meaning that we can conduct fine-grained distributional analysis in this context. And third, because economic feedback effects are thought to be small for most policy reforms, conventional estimates are often a suitable approximation for a score that includes economic changes.

The downside, though, is that for larger or more fundamental policy proposals, ignoring macroeconomic feedback is an unrealistic assumption. For example, a policy reform that would increase deficits by $5 trillion annually would almost certainly have meaningful impacts on interest rates, employment, and investment. The more dramatic the policy change, the more imprecise a conventional score becomes by ignoring macroeconomic feedback.

Dynamic estimates

A policy reform can affect the broader economy through its impacts on work incentives, investment and savings decisions, and the federal deficit. When individuals or firms make changes to their economic decisions, a chain

reaction of additional responses may follow until the economy reaches a different equilibrium with new values for wages, prices, interest rates, output, and more. *Dynamic* scores account for these broad macroeconomic changes and their feedback effects on the federal budget.

A dynamic estimate requires the use of a macroeconomic model, typically a *general equilibrium* model. These models treat macroeconomic variables as jointly determined, meaning that changes in one area of the economy can flow through to other areas. They are often "micro-founded", meaning that aggregate outcomes are modeled as the collective result of utility-optimizing individuals behaving in accordance with their preferences, resource constraints, and broader macroeconomic conditions. This modeling requirement contrasts with that of conventional estimates, which can be based on microsimulation or econometric models.

Dynamic estimates capture effects that economists generally believe are important. They are also well-suited for the task of modeling large or fundamental policy reforms – changes so dramatic that the future would be difficult to predict based on statistical correlations seen in the past. But these estimates come with several important limitations. First, dynamic scores are sensitive to assumptions about how the macroeconomy works. Second, estimating macroeconomic feedback in general equilibrium is a computationally intensive undertaking, meaning that dynamic models require abstracting away from the degree of detail that conventional estimates can include. Third, because most dynamic models require that deficits eventually be financed, they require making guesses about future policy changes not specified under current law.

Estimates incorporating microeconomic responses

In some cases, we produce estimates that fall somewhere between conventional and dynamic. These estimates incorporate *microeconomic* responses, in which we go beyond the narrow range of behavior allowed by conventional estimates but stop short of a full accounting of broader economic impacts. In other words, these are partial-equilibrium economic changes rather than general-equilibrium economic changes. Examples include:

- **Changes in labor supply.** Removing the earnings phase-in from the Child Tax Credit would reduce the return to work, which might cause some parents to drop out of the labor force.
- **Productivity effects.** Universal pre-K might improve educational outcomes and increase long-run productivity.
- **Population growth.** Immigration policy mechanically increases or decreases the population, which has first-order budgetary implications.

The line between conventional behavioral responses and microeconomic responses is thin. For example, substituting away from fossil fuels and into renewables is certainly a kind of "microeconomic" response. The difference, however, is that the former is limited to relative price changes only and holds total economic output fixed, whereas the latter allows for broader economic changes – *without modeling the general equilibrium effects of those changes*.

Consider an EITC expansion which increases the incentive to work. A conventional revenue estimate would not account for labor supply changes. A dynamic analysis would allow for labor supply changes, which in turn might affect wages, which further impacts prices, interest rates, and so on, until a new equilibrium is reached. But our microeconomic feedback estimates would stop at the first step in that process – the increase in labor supply and its associated budgetary feedback effects. In other words, when we incorporate microeconomic feedback into a budget estimate, we are approximating economic feedback without doing a full dynamic analysis.

In the right context, we believe this kind of estimate allows for a useful middle ground which combines the realism of conventional estimates with the economic substance of dynamic estimates. For example, it is worthwhile to know how a CTC reform which affects low-income mothers' work incentives would translate to employment changes. But the affected population is narrow in the context of the broader economy, and so any second-order general equilibrium effects are likely to be small – meaning that microeconomic responses are a suitable approximation of macroeconomic responses in this case.