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Model Update Overview

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Model Update Overview

- Calibrating the 10-year budget projections to CBO's August 23, 2016 Budget and Economic Outlook
- Discount rate for net present value of capital depreciation updated
- Steady state inflation and growth rates updated
- Imputation of income for the Earned Income Tax Credit added
- Beta version of spending model added
Model Update Details

Data Updates

The October model release updates the 10-year budget window projections in the TAG Model to the budget window projection in the August 22th, 2016 release of the Congressional Budget Office’s Budget and Economic Outlook report. The TAG Model does not attempt to estimate economic and budget baselines; rather, it estimates changes to a given baseline that result from a set of tax proposals. As a result, it relies on the most recent CBO baseline projections.

Update to Discount Rates

In order to calculate the marginal effective tax rate on capital investment, the TAG model uses a service price of capital formula similar to one developed by Robert Hall and Dale Jorgenson. This formula basically measures the minimum rate of return on a capital that would be required to justify the capital investment, net of taxes and depreciation.2

The TAG model uses the Baa corporate bond yield as the discount rate for calculating the net present value of the depreciation deductions that feed into the service price formula. The net present value of the tax deduction is analogous to the amount of money for which a company could sell its future tax deductions if the tax deductions were transferable. As such, the Baa corporate bond yield is used as a proxy for the cost of holding capital.

Previously, the TAG model used the 2008 average Baa corporate bond yield, to align with the model’s use of the 2008 IRS Public Use File. Now, the model has been updated to reflect a moving average of Moody’s Baa corporate bond yield as of October 2016. Because the average Baa corporate bond yield has fallen since 2008, we expect that this change will lead to economic results that are smaller in magnitude, across-the-board.

In addition to the discount factor that feeds into the service price of capital, the TAG model uses a nominal GDP growth rate to discount depreciation deductions for purposes of calculating corporate tax revenue in the steady state. The net present value of depreciation deductions is calculated using long-run growth and inflation rates. Given the prevailing inflation has remained below the Federal Reserve target rate, the model has updated to match the Federal Reserve’s target rate of 2 percent. In addition, the CBO has downgraded long-run GDP growth of the United States to 2 percent. Both of these parameters have been updated in this release. This update will slightly increase the present discounted value of depreciation deductions under current law.

Imputing Income for Earned Income Tax Credit

The Earned Income Tax Credit relies on a definition of income that is different from AGI. This definition is included in the Public Use File provided by the IRS, but only for current EITC filers. When a tax proposal changes the thresholds of the credit, new tax filers may be able to claim the credit. In order to determine which tax filers would become eligible for the credit under different thresholds, we impute a value of earned income for households that do not currently receive the EITC. The October release fixes a bug in our imputation of earned income.

Spending Model

The Tax Foundation has expanded the TAG model to include the effects of changes to government spending. This is part of a larger initiative to track the changes in demand for goods, services, and leisure in response to tax and government spending policy changes. By capturing the demand side of the economy, the TAG model, which is rooted in a supply-side production model, becomes what is known as a general equilibrium model. In other words, the new model will not only capture the changes in production and income from policy changes, it will be able to describe the uses of the income (that is, what it is spent on). When both the sources and uses of income are modeled, it provides a more complete picture of the economy, including uses and sources of saving, and international capital flows and trade balances.

The new spending model captures two specific parts of government spending: transfer payments and government employment. In a subsequent update, we plan to add the economic effects of government infrastructure investment. The transfer payment module captures changes to incentives to work and save when government provides transfers to individuals through programs such as unemployment insurance, welfare, and Social Security. The government employment module captures the effect of increased government employment on the labor market.

Both the transfer payment and government employment modules are prototypes. As such, considerable beta testing is required before the model can be validated by the economic community. Although the spending module is included in this update, it does not affect any model results regarding the effects of changes in tax policy.

Spending Model: Transfer Payment Module

Some transfer payments affect the opportunity cost of working. If unemployed individuals pay no taxes and receive no transfer payments, they face a choice between earning nothing by not working and earning a wage by working. The difference between the wage and the next best alternative is the real return to working. When transfer payments are available, the laborer chooses between the wage and receiving a transfer payment. Therefore, the real return to working shrinks as transfer payments to non-workers increase.
The transfer payment module includes an updated labor elasticity function with a transfer payment adjustment to the wage. As such, increased transfer payments reduce the incentive for working and thus contract the labor force. A smaller labor force results in a smaller GDP.

**Spending Model: Government Employment**

Expansion of government employment draws on the same pool of talent as does the private market. If the government sector expands employment, it must offer wages high enough to attract the talent away from the private market into the government sector. As such, an expansion of government puts upward pressure on the wage.

The new government sector module tracks employment by the government. Increased government employment raises wages, which raises the cost of hiring in the private sector as well as labor force participation. Thus, an increase in government employment may increase the total labor force while reducing the portion of the labor force available for private production.