# MACROECONOMIC MODELING AT THE JOINT COMMITTEE ON TAXATION



**Prepared by the Staff of the Joint Committee on Taxation**

# Conventional versus Macroeconomic Estimates

❑ The conventional estimates that JCT provides for all proposed tax legislation incorporate behavioral responses that are consistent with a fixed GNP assumption.

❑ Such conventional responses that are relevant to tax reform analysis include

➢ Shifts in entity form;

➢ Profit shifting unrelated to location of economic activity;

➢ Shifting between tax-favored and non-tax-favored forms of income;

➢ And timing of income recognition/realization.

# JCT Estimating Models

❑ JCT uses many different models to produce conventional estimates:

  ➢ **An individual tax model to forecast revenues from the individual income tax and from employment taxes;**

  ➢ **A corporate model for the corporate income tax;**

  ➢ **A foreign model for cross-border business income;**

  ➢ **An estate and gift model for changes to estate and gift taxes;**

  ➢ **Many different excise tax models;**

  ➢ **And many smaller tax, credit, or exclusion specific models.**

❑ JCT's Individual Tax Model is a representation of all 178 million U.S. tax filing units (actual and potential).

  ➢ **The core of the Individual Tax Model is a tax calculator that simulates taxpayers filling out tax returns – in some ways like commercial tax preparation software.**

  ➢ **To estimate a proposal, the calculator is run once assuming a base law (usually present law), and once after the proposed change has been incorporated.**

  ➢ **This calculator is also used to calculate changes in average and marginal tax rates due to proposals.**

# JCT Macroeconomic Models

Macroeconomic Equilibrium Growth Model (MEG)

Overlapping Generations Model (OLG)

Dynamic Stochastic General Equilibrium Model (DSGE)

# MEG, OLG, AND DSGE Models: Similar Neoclassical Foundations

- ❑ Consumption is modeled according to life-cycle consumption patterns.

- ❑ Labor supply responds to marginal and average changes in after-tax wages.

- ❑ Saving and consumption respond to after-tax return to saving and after-tax income.

- ❑ Business investment responds to expected return on investment and to after-tax cost of capital, which is affected by the availability of savings.

- ❑ The after tax cost of capital includes effects of taxes on income from investment, including dividends and capital gains.

# Macroeconomic Equilibrium Growth Model (MEG)

❑ In the MEG model, prices adjust so that demand equals supply in the long run, but not necessarily in the short run.

❑ Labor supply responses to changes in after-tax wages (elasticities) are separately modeled for four different groups:
  ➢ **High-income primary earners;**
  ➢ **High-income secondary earners;**
  ➢ **Low-income primary earners; and**
  ➢ **Low-income secondary earners**

❑ Business production and housing production are modeled separately; corporate and non-corporate businesses are represented as a single business sector, with taxation based on a weighted average of these sectors from JCT tax models.

❑ MEG is an open economy model; cross border capital flows and changes in net exports affect domestic economy outcomes. Exchange rates adjust to maintain purchasing power parity.

❑ Individuals are myopic; because they do not anticipate future changes in the deficit, the model can be run with no fiscal closing assumption.

# Overlapping Generations Model (OLG)

- The OLG model assumes that prices adjust to any changes in economic conditions (such as a change in fiscal policy).

  - **Supply equals demand in both the short and long run.**
  - **There is no monetary sector; OLG is a real model.**

- Economic decisions are modeled separately for each of 55 adult-age cohorts.

- Production sectors for corporate business, non corporate business, and housing are modeled separately.

- OLG is an open-economy model:

  - **Includes a multinational corporate sector with foreign subsidiaries;**
  - **Separately models cross-border intangible and tangible capital flows;**
  - **Purchasing power parity is assumed, which has the same effect as instantaneous exchange rate adjustment.**

- OLG is a perfect foresight model.

  - **Responsiveness of individuals to expected future changes in after-tax rates of return are important.**
  - **The model cannot allow the Federal government debt to grow faster than GDP for an indeterminate period.**
  - **The fiscal closing assumption can be modeled as occurring 20 or 30 years in the future, depending on the proposal.**

# Dynamic Stochastic General Equilibrium Model (DSGE)

- In the DSGE model, similar to in the MEG model, sticky prices and adjustment costs cause output to be sensitive to demand.

- Unlike the MEG and OLG models, the DSGE model incorporates uncertainty about future government policy, affecting adjustment to policy.  As in the OLG model, agents in the DSGE model cannot expect the Federal government debt to grow faster than GDP for an indeterminate period.

  - **Varying anticipation of the length of this adjustment period can provide insight into the effects of this assumption.**
  - **Varying the length of anticipated fiscal adjustments also allows analysis of announcement effects for policies.**

- Economic decisions are modeled separately for savers and non-savers.

  - **Savers make investment decisions and supply capital to a single business sector (as in MEG);**
  - **Non-savers do not own capital, have no access to credit markets, and have lower incomes;**
  - **Non-savers may respond differently from savers to tax policy changes.**

- The DSGE model is currently a closed economy that does not model international capital flows.

# JCT Macroeconomic Analysis –Example

❑ The "Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010," extended tax cuts from 2001 and 2003 for the years 2011 and 2012.

➢ **The JCT staff estimated that the bill would increase real GDP between 0.6 and 1.7 percent during 2011-2012 relative to present law, primarily because of extra demand that would be generated by the tax cuts.**

➢ **By the end of the 10-year budget period, these effects are estimated to reverse, with GDP decreasing by 0.2 to 0.5 percent relative to present law during 2016-2020, as increased borrowing by the Federal government crowds out some private investment.**

➢ **Correspondingly, the JCT staff estimated that there could be a 0.2 to 0.3 percent increase in receipts due to the increase in GDP in 2011-12, and a 0.3 to 0.6 percent decrease in receipts due to the decrease in GDP during 2016-2020.**

Reference:  JCX-48-11

# Further References on the JCT Macroeconomic Models and Analysis

**JCX-134-15**:  (October 27, 2015)

A Report to the Congressional Budget Office of the Macroeconomic Effects of H.R. 2510, "Bonus Depreciation Modified and Made Permanent," As Ordered to be Reported by The House Committee on Ways and Means

**JCX-107-15**:  (August 04, 2015)

A Report to The Congressional Budget Office of The Macroeconomic Effects of The "Tax Relief Extension Act Of 2015," As Ordered To be Reported by the Senate Committee on Finance

**JCX-3-15**:  (January 26, 2015)

Macroeconomic Analysis at The Joint Committee on Taxation and the Mechanics of Its Implementation

**JCX-22-14**:  (February 26, 2014)

Macroeconomic Analysis of the "Tax Reform Act of 2014"

**JCX-48-11**:  (September 21, 2011)

Testimony of the Staff of the Joint Committee on Taxation before the House Committee on Ways and Means Regarding Economic Modeling

# Further References on the JCT Macroeconomic Models and Analysis

JCX-46-11:  (September 19, 2011)

Summary of Economic Models and Estimating Practices of the Staff of the Joint Committee on Taxation

JCX-53-06:  (December 14, 2006)

Macroeconomic Analysis of a Proposal to Broaden the Individual Income Tax Base and Lower Individual Income Tax Rates

JCX-19-06:  (June 16, 2006)

Exploring Issues in the Development of Macroeconomic Models for Use in Tax Policy Analysis

JCX-4-05:  (March 1, 2005)

Macroeconomic Analysis of Various Proposals to Provide $500 Billion in Tax Relief

JCX-105-03:  (December 22, 2003)

Overview of Work of the Staff of the Joint Committee on Taxation to Model the Macroeconomic Effects of Proposed Tax Legislation to Comply With House Rule XIII.3.(h)(2)

JCX-21-97:  (November 20, 1997)

Joint Committee on Taxation Tax Modeling Project and 1997 Tax Symposium Papers