



Inside the JCT Revenue Estimating Process

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PART I:

Current JCT Estimating Process

- The Team
- Baseline and “As Amended” Projections
- JCT Models
- Dynamic Microeconomic Estimates
- Quality Control



JCT Revenue Estimating Team (2007)

- 17 PhD economists specializing in revenue estimates
 - 10 years average experience in this work

- Together with lawyers, policy economists and accountants
 - 16 lawyers
 - 3 PhD policy economists
 - 2 accountants

- An interdisciplinary approach
 - Every JCT revenue estimate is a joint product of economist, lawyer and accountant input
 - This is unique to JCT and Treasury— others rely entirely on economists
 - Combination ensures that JCT estimates are grounded in realities of actual words of statute – and creative taxpayer ways around those words

- To handle 7,800 revenue estimate requests in 2007



What is a JCT Revenue Estimate?

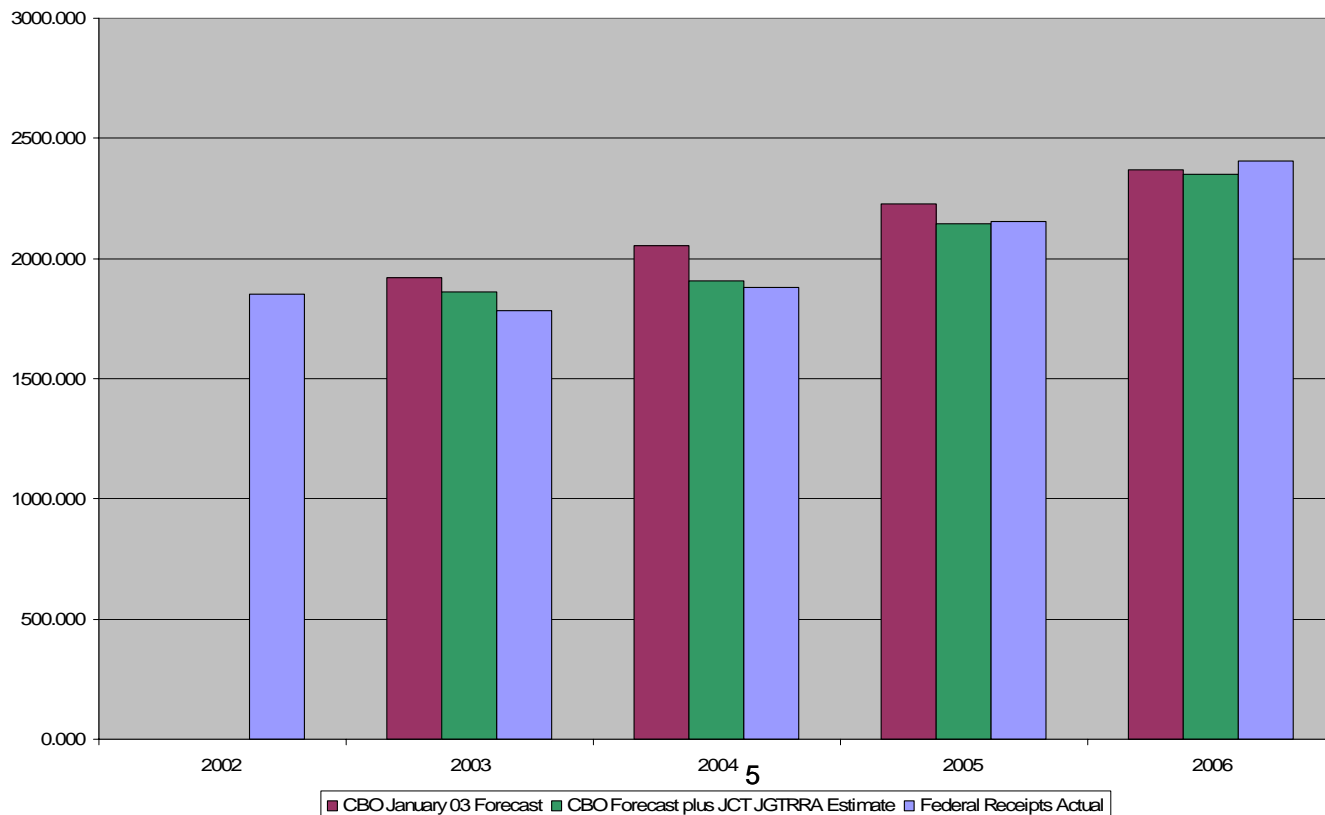
- A JCT revenue estimate compares two *predicted* streams of federal revenues:
 - Predicted revenues under current law (“**Revenue Baseline**”)
 - Predicted revenues under proposed new law (“**As Amended**” **Revenues**)
- The comparison covers the 10-year “budget window”
- Our estimates do *not* compare “As Amended” Revenues with *current* revenues
 - Estimate compares our predictions of (1) future revenues under current law with (2) future revenues under the new proposal
- Consequence: In a growing economy, JCT can estimate revenue “losses” while implicitly predicting higher absolute *revenues*
 - In absence of law change, revenues would have climbed even more
 - Next slide illustrates this point



Simultaneous Revenue “Losses” And Higher Collections

- JCT estimated that 2003 Act would “lose” revenue
 - These “losses” came against baseline of projected increasing receipts
 - Result: Revenue shortfall compared to baseline but good prediction of increase in actual government receipts

Fiscal Year Federal Receipts Current Dollars





The Revenue Baseline

- JCT begins with CBO's 10-year macroeconomic Budget Baseline
 - CBO macroeconomic Budget Baseline captures predicted growth in economy and other long-term trends
- JCT then refines CBO's Budget Baseline to create a detailed Revenue Baseline specific to each proposed new tax law
- JCT Revenue Baseline applies the *current* Tax Code
 - We do not predict future Congressional action
 - We assume that phase-ins and sunsets will occur as scheduled
- JCT Revenue Baseline does predict future judicial decisions
 - Future cases interpret what the law is today
 - Requires JCT economists and lawyers to consult closely
 - Relevant only in unusual circumstances
 - *Examples:* Economic Substance, SILOs



“As Amended” Revenue Projections

- “As Amended” projections require JCT to predict future revenue streams resulting from a hypothetical new tax law

- These projections cannot be a linear extrapolation from the past
 - The point of a proposed change in law . . . is to change things!
 - Taxpayers will behave differently in the “As Amended” environment
 - Proposed new rule may interact with existing tax law
 - *Example*: increasing the standard deduction will cause some itemizers to become non-itemizers
 - But the AMT may induce some taxpayers that switch in early years to switch back in later years

- JCT relies on sophisticated *tax models* to predict expected “real life” future tax revenues resulting from enacting a tax proposal



What Is a “Tax Model” Anyway?

- Many people are familiar with TurboTax

- TurboTax saves time and aggravation, but it is *not* a tax model -- it is a **tax calculator**
 - It accepts relevant factual inputs (income, deductions, marital status, etc.) for a year
 - It is “hardwired” to calculate the taxpayer’s resulting tax liability for that year, in light of the tax law’s operative rules

- TurboTax is *static* and *backward looking*
 - Programmed to calculate one taxpayer’s tax liability, based on historic factual inputs and actual tax law rules for that year
 - Not designed to project future tax liability
 - Only updated once a year for any actual tax law changes
 - *Not capable of adjustment for projected trends or changes in future behavior*



Tax Models vs Tax Calculators

- JCT, by contrast, relies on computer **tax models**
 - A computer model *simulates reality*. It can be run multiple times, with slightly different inputs, to see the different futures that evolve
 - In The Sims (a “virtual world” computer game), a player interacts with virtual on-screen characters. The virtual characters seem alive, but are acting according to the game’s complex programming rules
 - In a JCT tax model virtual taxpayers react to the JCT economist’s new inputs in a roughly analogous manner
- *The critical difference between a tax calculator and a JCT tax model is that the JCT model creates a “virtual world” of American economic activity, both today and over the next 10 years*
 - Virtual taxpayers inside the JCT model are presumed always to act rationally (unlike The Sims!)
 - So the model’s virtual taxpayers react to their own evolving personal tax situations and changes in law by changing their behavior to minimize their taxes



Inside the JCT Individual Tax Model

- JCT's Individual Tax Model is a “virtual world” of all 130 million U.S. individual tax filers
 - All categories of taxpayers
 - For each of the 10 years in the budget window
 - Taking into account projected economic, demographic and social trends

- Individual Tax Model uses 180,000 actual tax year 2003 returns
 - Income items and population weights are adjusted annually to calibrate with the CBO Budget Baseline
 - Missing income or deduction items are “*imputed*” using statistical methods
 - The “imputation” work relies on JCT's economic research, including reviews of data sources other than tax returns
 - This work requires a substantial amount of PhD economists' time to update every year



“As Amended” Revenue Projections Reflect Behavioral Responses

- Every JCT revenue estimate is a “dynamic” estimate
 - *Our estimates reflect taxpayers’ predicted reactions to a new law*

- The Individual Tax Model automatically applies its actual and imputed data to predict which tax elections taxpayers will make in the future as a response to a new tax law
 - *Example: Future itemized deductions by current non-itemizers*

- But the tax calculator portion of the Tax Model by itself can account only for limited taxpayer behavioral responses
 - JCT’s PhD economists reflect more sophisticated taxpayer tradeoffs by drawing on economic literature and their own research to reprogram the “virtual world” of the Tax Model
 - By reprogramming the Model’s internal “rules,” we incorporate taxpayers’ projected responses in the “As Amended” environment



How Do JCT Tax Models Incorporate Taxpayer Behavior?

- JCT economists incorporate taxpayer behavior into a Tax Model by reprogramming the rules of its “virtual world” to reflect the *elasticity* of supply or demand to proposed new tax rules
 - *Example:* If gas prices go up \$0.50/gallon (because of an excise tax hike), how will taxpayers adjust their consumption of gas?
 - *Example:* If capital gains tax rates are increased, how much longer will taxpayers hold onto assets before selling them at a profit?

- But elasticities are tricky to measure!
 - The response to a \$1.00/gallon gas tax hike is not necessarily twice that of a \$0.50/gallon hike
 - Tax packages often involve complex interactions across items
 - *Example:* A proposal might both raise the gas tax and lower income taxes for most individuals. One costs consumers money; the other puts money in their pockets. How will taxpayers adjust their gas consumption in that case?



Quantifying Taxpayer Behavior

- JCT's PhD economists must determine and express in mathematical terms projected taxpayer responses to a proposal
 - That is, they must use the language of mathematics to describe the *elasticity* of supply and demand in response to the proposal
 - This information can then be incorporated into the Tax Model's internal rules that govern its "virtual world"
- Predicting behavioral responses requires original research as well as knowledge of the relevant economics literature
 - JCT economists draw on all relevant available economic and commercial databases
- JCT economists consult closely with JCT lawyers, to understand the law and taxpayer planning or avoidance strategies
 - This is a critical difference between JCT Revenue Estimates and most other economic projections



The Result – A Dynamic Revenue Estimate

- JCT Tax Models assume that taxpayers will behave rationally to optimize their after-tax incomes in the “As Amended” environment
- JCT economists feed into the relevant Tax Model the conclusions of their research on supply/demand elasticities in response to the new tax proposal
- The resulting “As Amended” Revenue Projection reflects:
 - Changes in the timing of transactions and income recognition
(*Example: Realization of capital gains in response to changes in rates*)
 - Changes between business sectors or the legal form of doing business
(*Example: Organizing a partnership rather than a corporation*)
 - Changes in types of portfolio investments
(*Example: Sell bonds and buy stock to obtain 15% rate*)
 - Changes in the amount, types, and timing of consumption
(*Example: Employer-provided health insurance*)
 - Tax planning and tax avoidance (or evasion) strategies



Dynamic Analysis Example

- Tobacco Excise Tax Hike
 - JCT starts with the CBO tobacco excise tax Budget Baseline
 - JCT expands that data to encompass the detail required to estimate
 - JCT economists research price elasticities of cigarette smoking in the range contemplated by the new tax increase
 - JCT economists reprogram the Excise Tax Model to reflect our conclusions on how smokers will respond to these higher prices:
 - Some potential smokers will never start
 - Some smokers will decide to quit;
 - Some smokers will reduce the amount they smoke.
- *Example:* JCT estimated that SCHIP's \$0.61/pack excise tax hike would result in 2 billion fewer cigarettes sold annually; our estimate reflected this smaller tax base

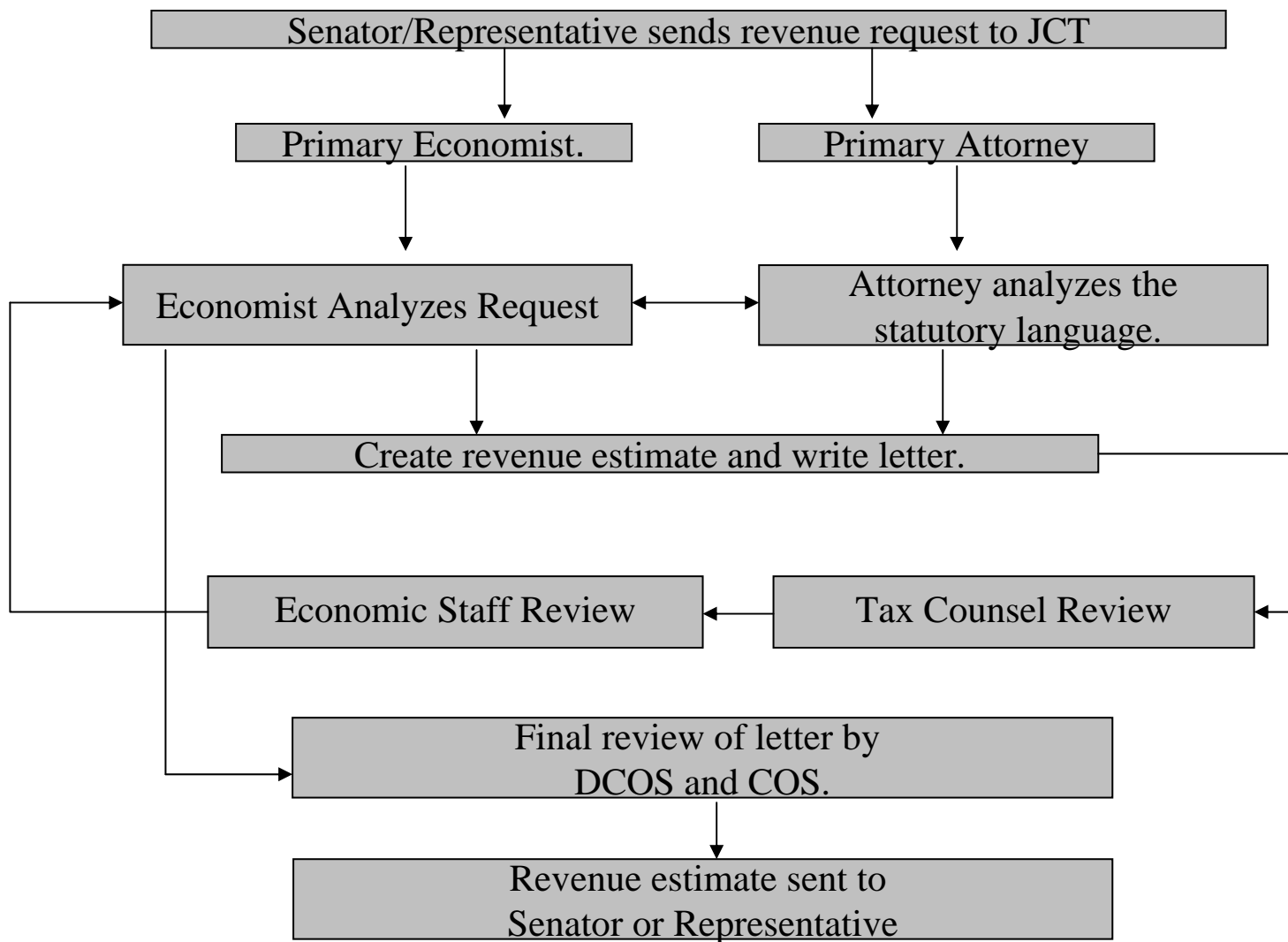


Dynamic Analysis Example

- Cap the Exclusion on Employer Paid Health Insurance
 - Employer paid health insurance is currently nontaxable and does not show up on tax returns
 - JCT statistically matches medical expenditure panel survey data to each tax return on the tax model in order to determine months of insurance coverage for each taxpayer
 - JCT uses data from a variety of sources to impute premium values to each taxpayer with coverage
 - JCT calculates the effect of the exclusion cap on the after-tax price of health insurance for each taxpayer on the model
 - JCT uses health insurance price elasticities from health economics literature to determine behavioral responses in insurance coverage and cash wages as a result of the cap
 - Revenue estimate represents projected changes in taxable income after taking into account the cap amount and behavioral changes in insurance coverage and cash wages



JCT Quality Control and Process





PART II:

Macroeconomic Revenue Forecasting

- Why?
- Why Not?
- How Difficult?
- How Reliable?



“Macroeconomic” Revenue Estimates

- A standard JCT estimate incorporates behavioral responses in projecting tax revenues, but assumes that these tax and behavioral changes do not in turn ‘move the needle’ of the entire US economy
- This is termed the “**Fixed GNP Constraint**”
 - Generally assumes that total labor supply and investment are fixed
 - For example, we assume that a surtax on labor income will not cause taxpayers to retire early, or simply to work less hard
- The alternative is a “macroeconomic” revenue estimate
 - “Macro” estimates incorporate a feedback loop – changes to tax law and behavior are assumed to affect the overall economy, which in turn would affect future tax revenues
- In a perfect world, all tax estimates would be “macro” estimates
 - Then why doesn’t JCT generally provide “macro” estimates?
 - And how much does this hurt the accuracy of JCT estimates?



Imperfect World of Fixed GNP

- Fixed GNP Constraint is a practical necessity
 - “Macro” forecasts are extraordinarily time-consuming
 - JCT received about **8,000** revenue estimate requests in 2007

- Fixed GNP Constraint permits reliable comparisons across proposals and treats budget’s revenue and spending sides similarly
 - Consistent with CBO methodology for appropriations proposals

- Fixed GNP Constraint clearly valid for most proposals
 - US GNP is \$13+ trillion/year
 - A \$500 billion tax change over 10 years = 0.0038 of 10-year GNP
 - Many proposals cause shifts between sectors, but are not likely to change the overall level of economic activity
 - Most proposals move tax laws within relatively narrow bounds, where macroeconomic feedback effect can be expected not to dominate



Reliability Issues in “Macro” Estimates

- JCT’s conventional revenue estimates are not perfect, but they are comparable to each other, and they provide accurate rank ordering comparisons among estimates
- “Macro” estimates by contrast are less reliable
 - Supply-side effects can take several years to affect growth
 - Empirical research papers often do not agree on predicted outcomes
 - Economists still disagree, for example, over the “macro” effects of 2001 \$300/taxpayer rebate
 - “Macro” estimates also require predicting uncontrollable factors like the Fed’s interest rate moves
 - And as described below, “macro” estimates are extremely sensitive to assumptions about how a tax cut is financed
- Simple “macro scale back” factors are just guesstimates
 - They fail to reflect interactions with other Tax Code provisions
 - They fail to back out “micro” behavioral consequences already captured by JCT conventional estimating process



“Macro” Estimates Do Differ from Conventional Ones

- JCT and other professionals agree that well-designed tax cuts have *some* predictable positive feedback effects on future tax revenues by increasing capital or labor supply
 - *Example:* One JCT “macro” study estimated these cost mitigation benefits for a corporate tax rate cut could range up to 30% of the “conventional” estimate
- The magnitudes of these estimated effects can vary dramatically, however, depending on the type of tax cut, and key assumptions:
 - Behavioral elasticities (e.g., elasticity of savings)
 - Foresight of taxpayers (do households have perfect foresight?)
 - Time horizon of taxpayers (do households have infinite patience?)
 - How the tax cut is financed
- Different types of tax cuts have different “macro” feedback effects
 - A tax cut that did not materially change behavior (e.g., a poorly-designed tax “incentive”) would have no positive growth effects
 - Many economists believe that a “macro” (vs. a “conventional”) approach is likely to reduce the estimated cost of a well-designed tax cut on capital income more than it would on labor income



“Macro” Estimates Depend Critically on Assumed Financing Decisions

- Every tax cut must be financed somehow
 - The positive feedback loop (in which tax cuts increase capital (or labor) supply, in turn yielding higher tax revenues) takes years to play out, and also falls short of a complete offset
 - A tax cut’s shortfall in revenues therefore must be financed by:
 - deficit financing (borrowing),
 - cutting government spending, or
 - Offsetting tax increases (i.e, no net tax cut at all)
- Most analyses (including a 2006 Treasury study) conclude that any predicted positive feedback effects from a net tax cut are dependent on financing the tax cut with corresponding spending cuts
 - *Without corresponding spending reductions, these models predict that most or all of the long-term economic benefits of net tax cuts will disappear*



Both Growth and Welfare Depend on the Spending Cuts Chosen

- Any tax cut can be financed by different types of spending cuts:
 - Cuts in Government purchases of goods/services (e.g., medical care)
 - Cuts in Government investment (e.g., bridges and highways)
 - Cuts in Government transfer payments (e.g., unemployment checks)

- The spending that is cut in turn might be wasteful or productive

- Different assumptions about these aspects of the spending cuts used to finance a tax reduction can dramatically change its estimated growth effect (i.e., estimated future tax revenues)

- And, less appreciated, the distributional effects of a tax cut are dramatically affected by the spending cuts chosen to finance it
 - For example, cutting transfer payments to fund capital income tax cuts may increase total wealth, but also increase inequality



But Don't "Macro" Analyses Prove That Tax Cuts Pay For Themselves?

- The claim is that we can cut taxes today, borrow money to cover the shortfall, and repay the borrowing from increased tax revenues in the future derived from the tax cut's positive growth effects
- We are not aware of any peer-reviewed literature that reaches this conclusion for modern tax rates
 - *"While the supply-side effects of taxes are important to consider, they are usually not enough to cause tax revenue to rise when tax rates fall."* – N. Gregory Mankiw, Principles of Macroeconomics
 - Most peer-reviewed criticism of the JCT conventional estimating approach makes the more modest claim that well-designed tax cuts are **not as costly** as the Fixed GNP Constraint makes them appear
- JCT, CRS, Treasury (2006) and others agree that net tax cuts without spending cuts lead to unsustainable government borrowing
 - *"An important feature of this [Treasury's macroeconomics] . . . model is that a permanent reduction in taxes . . . would lead to an unsustainable accumulation of government debt relative to GNP In this type of model, the tax relief is typically financed by an offsetting change in taxes or spending"* (Treasury July 2006 study)



Estimating Conclusions

- Congress and JCT live in an imperfect world, and must act with imperfect information
- The current JCT estimating process usually is reliable for its intended purposes (comparing tax proposals to current law)
- JCT has in the past, and should more frequently in the future, provide supplemental “macro” information where it is likely to be meaningful, and of course as required by House or Senate Rules
- JCT can improve the confidence in, and quality of, its workproduct through greater transparency
 - More publications on methodological issues
 - Peer review and/or more publication of models
 - Greater use of “backwards looking” validation methodologies