FISCAL ISSUES No. 10

Federal Revenue Estimates: What's Wrong; What Should Be Done

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Sponsored by
Savers & Investors Foundation

Institute for Research on the Economics of Taxation (IRET)

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IRET is a non-profit, tax exempt 501(c)3 economic policy research organization devoted to informing the public about policies that will promote economic growth and efficient operation of the free market economy.

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Foreword

This project was supported by a grant from the ***Savers & Investors Foundation***. The president of that ***Foundation***, W. Thomas Kelly, had long urged **IRET** to produce a study critically evaluating the revenue estimation methods currently used by Congressional and Administration officials. The ***Foundation's*** encouragement was of great assistance in completing this project.

The **IRET** study focuses on the assumption of government revenue estimators that tax changes have no effect on major economic variables such as total employment, output, and productivity. The study finds that the estimators' assumption is mistaken. An alternative methodology taking account of the saving, investing, and work responses to the incentive effects of tax changes would provide much better guidance to policymakers than current estimates.

IRET offers this study with the hope that it will help to clarify the issues that policymakers must resolve if tax policy is to be guided by a realistic assessment of how taxes affect economic and budget outcomes.

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EXECUTIVE SUMMARY

Tax changes alter after-tax prices and costs, thereby modifying the relative attractiveness of various products and activities. People respond to these incentive changes by adjusting how they use resources. The resulting tax-induced resource adjustments, in addition to affecting the mix of inputs used in production, the kinds of goods and services businesses produce, and the types of jobs available, often change the total amount of labor and capital services, hence, total production and total income These changes in total employment and total income affect the bases of virtually every tax in the federal revenue system and the revenues the taxes produce.

In opposition to this reality, the government's official revenue estimators proceed on the assumption that tax changes never affect overall economic activity. It is assumed, for example, that total employment and output will be the same whether personal income tax rates are raised or lowered, whether the capital gains tax rate is increased or decreased, whether the payroll tax rate is boosted or reduced, whether businesses are allowed to deduct their capital expenditures more promptly or more slowly. Further, although the estimators generally account for the adjustments that occur in response to excise tax changes and some other tax changes, such adjustments are limited to the markets directly affected by the tax changes, and the tax changes are explicitly deemed to have no effect whatever outside those markets.

These inadequacies in the official revenue estimation methodology mislead policymakers. According to the official numbers, tax hikes appear to generate bigger increases in revenue with fewer side effects than they really do, while tax reductions seem

to bring about larger revenue losses with fewer benefits than is actually the case. This systematic bias encourages policymakers to adopt tax increases that would not be judged appropriate under a truer accounting of costs and benefits; by the same token, it discourages policymakers from enacting some tax decreases whose benefits in terms of other goals of tax policy outweigh the revenue costs, correctly measured.

Because of budget procedures legislated as part of the 1990 budget deal, the rules under which Congress considers revenue proposals give a critically important role to the official revenue estimates. In consequence, the systematic bias present in official revenue estimates is more likely than ever to push Congress towards undesirable policy choices.

In order to remove this bias from official revenue estimates, the estimation methodology must be basically changed. Of particular importance in this regard, the estimating methodology must take explicit account of how people respond to tax changes and how their responses affect the overall economy.

A large number of objections have been advanced to inclusion of macroeconomic behavioral feedbacks in the revenue estimating methodology. Many of these objections are discussed by the Congressional Budget Office (CBO) in its 1995 report, *Budget Estimates: Current Practices And Alternative Approaches*. On examination, none of the objections is convincing on either analytical or practical grounds. The exclusion of macroeconomic behavioral feedbacks from revenue estimates seriously misleads policymakers by systematically biasing the estimates toward higher tax rates and away from lower tax rates.

■ One claim is that macroeconomic feedbacks should be ignored because they are controversial, i.e., economists disagree about how taxes affect the economy and about the appropriate method of estimating the revenue feedbacks. Controversy cannot be avoided on this issue no matter what estimation methodology is selected. Assuming all macroeconomic feedbacks are zero is itself extremely controversial.

■ Another claim is that macroeconomic feedbacks are best omitted from official revenue estimates because they are very small. Empirical evidence, however, demonstrates that many tax changes have large macroeconomic feedbacks.

■ A related claim is that macroeconomic revenue effects are not worth including in revenue estimates because they allegedly take so long to occur that most of them lie beyond the budget window. In fact, the feedbacks are often substantial within a five or ten year budget window, although they may continue to build over time.

■ Yet another claim is that adding macroeconomic feedbacks to revenue estimates would greatly increase opportunities for "cooking the books". What this ignores is that performing revenue estimates as though all macroeconomic feedbacks are necessarily zero, despite overwhelming evidence to the contrary, itself blatantly "cooks of the books".

■ Another argument is that including macroeconomic effects in revenue estimates requires examining both short-run Keynesian (or cyclical) effects and incentive-based (or structural) effects. But predicting Keynesian effects would be difficult, the argument continues, because Keynesian responses to fiscal changes may be offset by Federal Reserve actions, and the exercise would be deceptive because Keynesian responses within the budget window are not representative of long-run effects. With structural effects, on the other hand, their impact within the budget window is supposedly not representative of their longer run impact. This argument's conclusion is that it would be best to ignore both incentive-driven and Keynesian macroeconomic effects. The reply is that Keynesian effects should be excluded from revenue estimates because the theory on which they are based is deficient. Incentive-based macroeconomic effects, in contrast, should be included because they rest on a solid analytical foundation and, as noted earlier, often are very significant within the budget window.

■ Still another claim is that excluding macroeconomic feedbacks is called for by budgetary caution. When taxes are cut, the omission of macroeconomic effects will tend to lift actual revenues above predicted revenues. When taxes are raised, though, ignoring macroeconomic feedbacks is risky, not cautious: it results in overestimating revenues and underestimating budget deficits.

■ Dropping the zero-macroeconomic-feedback constraint, it is claimed, would greatly increase the time needed to perform revenue estimates, imposing intolerable delays on Congress's schedule. The appropriate general equilibrium models, however, would allow the estimates to be done on a timely basis.

■ Another objection is that macroeconomic feedbacks should not be included in tax bill estimates unless they are also included in spending bill estimates. Spending bill estimates would also gain realism if their macroeconomic feedbacks were taken into account. If this is done, however, it is vital that the macroeconomic consequences of spending bills be modeled correctly. The Keynesian approach that assumes government spending leads to a net addition to output is not valid. Instead, it is necessary to recognize that in order to obtain the resources its programs and activities require, the government must take these resources from often more productive private uses. Thus, macroeconomic feedbacks of government are often negative and elevate the costs of government spending above official cost estimates that ignore the detrimental feedbacks.

■ One more objection, found to be without merit on examination, is that estimators lack legal authority to include macroeconomic feedbacks in their estimates.

■ Attaching explanatory and cautionary notes to revenue estimates, which the Joint Committee on Taxation (JCT) and the CBO offer as an alternative to reforming the methodology, would not correct the misleading quantitative estimates.

An appropriate revenue estimating methodology must identify the initial impact of fiscal actions (tax and spending measures) as altering one or more relative prices and/or costs, instead of initially or directly changing income.

The next step is to describe and measure how people in the private sector respond to these cost and price changes at the initial income levels. For example, changes in payroll taxes would be represented as changes in the marginal rate of income tax on labor returns, modifying the cost of working relative to leisure, hence altering the amount of labor services that would be offered at any given market rate of compensation. Such responses lead to changes in the level and composition of total output, hence total income. These changes in income themselves enter into decisions about working, saving and investing, leading to further changes in output and income. The tax-induced modifications in output and incomes affect the bases of the taxes comprising the federal tax system.

The magnitude of the tax base changes will vary not only with respect to the magnitude of the cost and price effects but also with respect to the responsiveness of taxpayers to these effects, i.e., the elasticity of their responses to the cost and price changes.

One of the major tasks in designing a model that realistically describes and measures the economic effects of fiscal changes is to identify and to estimate the factors that determine those elasticities.

Every tax in the federal revenue system alters the cost and price relationships that would otherwise result from the operations of the market system. The neoclassical, dynamic, general equilibrium analysis and the kind of model it calls for would afford far more realistic estimates of the revenue consequences of tax legislation than the official methodology now in use.

Federal Revenue Estimates: What's Wrong; What Should Be Done

Introduction: Why the Concern Over How Revenue Estimates Are Prepared?

Many federal budget policymakers are convinced that the existing methodologies employed in the executive branch and by Congressional staffs to estimate the revenue effects of proposed tax changes are conceptually and technically deficient. The estimates these methodologies produce, it is widely believed, are often seriously mistaken and give policymakers misleading information, resulting in budget policies that would not be approved if better, more realistic estimates were provided.

Of course, the real danger in leading policymakers astray is that it is ultimately the American people who suffer. Biased revenue estimates may stack the deck towards a tax system that is too complicated, too large, and too hostile to work and saving. One of the biggest enemies of tax policies aimed at fostering more rapid economic growth - which would mean more jobs, higher real wages, better opportunities for advancement, greater output, and more prosperity - may be revenue estimates based on the proposition that tax changes never affect how well or poorly the economy performs.[1]

The basis for questioning the findings of revenue estimates as currently performed is the conviction that the existing methodologies explicitly disregard important economic consequences of proposed tax changes on the

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[1] Beyond hampering efforts to improve various provisions in the current tax system, misleading revenue estimates may impede efforts fundamentally to restructure the tax system. For a discussion of this, see Alan Reynolds, "Estimates vs. Reality," Discussion and Background Paper in *Unleashing America's Potential*, Report Of The National Commission On Economic Growth And Tax Reform (Washington, DC: National Commission On Economic Growth And Tax Reform, 1996), pp. 40-43.

magnitude and composition of total output, hence, on total income and on the bases of the various taxes in the federal revenue system. The omissions necessarily result in inaccurate and deceptive revenue estimates.

Revenue estimates play two main roles. One is to help monitor and control federal revenues as part of the budget process. The other is to assist policymakers in choosing between revenues and other tax-policy goals by advising policymakers as to the revenue cost of those other goals.

With respect to the first role, if they are to carry out responsible budget planning, policymakers must have some idea of how proposed tax changes would influence future revenues. For instance, if policymakers decide to raise $20 billion of extra taxes over the next five years, they need estimates of how much they could collect with various tax proposals. As another example, if policymakers would like to enact a certain tax reform and have decided that they can fit it in the budget provided its revenue cost does not exceed $30 billion, they require a prediction of its revenue cost in order to determine whether it is "affordable," given their preset budget limit.

When policymakers approach legislative proposals with preset revenue targets, which they do frequently, they are, in effect, putting revenue estimates at the center of their legislative deliberations. It is common for Congress to adopt tax provisions that are widely acknowledged to be arbitrary, complicated, and damaging to productivity solely because the provisions are scored as revenue raisers and do not arouse much political opposition. In 1986, for instance, the Reagan Administration and Congress decided that their overhaul of the income tax system would be revenue neutral. Operationally, that gave enormous influence to the estimation methods and models of the staffs of the Treasury Department's Office of Tax Analysis (OTA) and Congress's Joint Committee on Taxation (JCT), which did the revenue scoring. Legislators added and discarded provisions from the package in order to obtain the JCT's revenue-neutrality stamp, and because the JCT continued modifying its revenue estimates up to the last moment, legislators continued tweaking the provisions to retain the JCT's seal of approval.

Legislative rules included in the Budget Enforcement Act of 1990 (BEA-90) have given added clout to the budget-control function of revenue estimates. Under the terms of the act, a tax change, proposed on the House or Senate floor, that is estimated to be a revenue loser during the budget "window" is subject to a point of order (i.e., may not be considered) unless it either is part of a larger package containing offsetting tax increases or is paired with cuts in the estimated amount of entitlement spending.[2] In the House, overcoming a point of order takes a simple majority, but in the Senate it requires a three-fifths supermajority. This so-called pay-as-you-go (PAYGO) rule means that tax legislation which the JCT scores as losing revenue needs supermajority support before it can gain Congressional approval.

The second role of revenue estimates is to help assess the tradeoffs between federal revenues and other goals of the tax system. Some of those other considerations are what a tax change would do to people's work and saving incentives, how it would affect the tax liabilities of people at different income levels, whether it would reduce or increase paperwork costs, how it would affect tax visibility (very important in showing citizens what they must pay for government services, although politicians often prefer concealed levies), and whether it would fall evenly or unevenly on various people as producers and consumers.

Here, too, the PAYGO rules favor revenue goals over economic policy objectives. For instance, a tax change that would worsen the tax penalty against saving and discriminate against various businesses and consumers but is scored as collecting more money than current law would encounter no formal legislative roadblocks because of its flaws and would not require a supermajority for passage. Conversely, a proposal that relieves some tax distortions but would lose tax revenue, according to official revenue estimates, would need a three-fifths supermajority and, if passed, might lead

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[2] The budget window is the several-year period for which outlay and revenue levels are set or estimated in the annual Congressional budget resolutions. The House generally uses a five-year budget window; the Senate generally uses five-and ten-year windows.

to a sequester later.[3] The formal rules of the legislative process now overemphasize revenue considerations at the expense of other desirable tax policy objectives.

If revenue estimates are biased because they give short shrift to the behavioral responses of affected taxpayers and how those responses will affect economic activity and, hence, tax bases, they will perform neither of their jobs properly. With regard to budget planning, revenues will tend consistently to fall short of expectations when Washington raises taxes because the negative feedbacks will be more severe than the official estimation models anticipated. With higher taxes routinely failing to generate all the extra revenue that had been counted on in budget forecasts, actual deficits following tax increases will generally exceed expectations.

The PAYGO rules certainly increase the harm that biased revenue estimates may cause. As the Congressional Budget Office (CBO) observed, "The introduction of the PAYGO rules in 1990 and the additional points of order in the Senate have also raised the stakes for estimating bills and made it more critical that all of a policy's effects be included in the cost estimate."[4] Hence, removing systematic distortions from revenue estimates, which would

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[3] The 1990 legislation, amending the terms of the Balanced Budget Act of 1985, requires the Office of Management and Budget (OMB) to estimate at the end of each Congressional session whether tax and entitlement legislation enacted during the session have increased estimated deficits. If the OMB, using the OTA's revenue estimates and its own spending estimates, computes that enacted legislation has increased estimated deficits, the OMB must order an across-the-board sequestration in non-exempt entitlement programs sufficient to offset the estimated deficit increase. Thus, if tax legislation estimated to lose revenues is not stopped in Congress, the PAYGO rules may well trigger a booby trap later.

[4] Congressional Budget Office, *Budget Estimates: Current Practices And Alternative Approaches*, CBO Papers (Washington, DC: Congressional Budget Office, January 1995), p. 5. Curiously, although this passage stresses the importance of including all effects, the report of which it is a part throws cold water on the idea of including the revenue effects that occur when tax changes strengthen or weaken the economy.

be valuable in any event, is all the more needed because of the PAYGO rules.[5]

The perceived systematic biases in official revenue estimates in favor of tax increases and against tax reductions have made these estimates the subject of growing controversy. The source of the problem is that the official estimates take no account of how people's behavioral responses to tax changes alter aggregate economic outcomes, hence tax revenues.

To illustrate why revenue estimates must take account of behavioral responses, suppose the government raises income tax rates, forcing people to pay more tax on their marginal dollars of income. Faced with higher tax rates, people will find it advantageous to adjust their economic behavior in various ways. Many will try to receive more income in nontaxable or lightly taxed forms, such as tax-exempt employer-provided health insurance. Some will decide to evade taxes: the stiffer tax bite on reported income increases the temptation to conceal income. Further, people will tend to work and save less because the government's action has diminished their after-tax rewards for working and saving. These changes in behavior are very likely to contract the income, payroll, and other tax bases. By themselves, the higher tax rates increase the tax bite on each dollar of income that is earned, and that tends to swell the U.S. Treasury's coffers. On the other hand, the higher rates also contract the tax base because they encourage people to receive more income in nontaxable or lightly taxed forms, to hide more of their reportable income from the government, and to work and save less. That slimmer tax base tends to reduce tax collections.

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[5] The PAYGO rules are in addition to other devices that can sometimes stop legislation that has simple majority support. In 1989, for example, then Senate Majority Leader George Mitchell used a filibuster to block a cut in the capital gains tax that had already passed the House and would have received Senate approval if it could have been brought to a vote. (See *Daily Tax Report*, November 16, 1989, pp. G-2 to G-3.) The PAYGO rules are more specialized than most parliamentary instruments, however: they stand ready to halt legislation estimated to reduce taxes but do nothing to stop Congress from raising taxes.

Moreover, the tax-induced behavioral responses, particularly the adverse effects on working and saving, have a negative impact on overall economic activity: with people working and saving less, the economy's supply of productive inputs is smaller than otherwise, and that depresses total production and income. Because many taxes have assessment bases that depend on the size of the economy, the higher income tax rates will cause a wide assortment of other taxes to collect less revenues than otherwise, contributing further to the negative feedbacks on tax revenue.[6]

Whether the behavioral responses and the consequent effects on aggregate output, aggregate income, tax bases, and tax revenues are large or small is not relevant. That there are such effects is widely acknowledged. Although the CBO opposes the inclusion of macroeconomic effects in revenue estimates, it does not deny that there are such effects, noting that "...enactment of some [tax or spending] proposals might affect the overall economy."[7]

In disregard of reality, however, the government's official revenue estimators currently use a methodology that deliberately ignores an entire category of behavioral feedback effects: those involving tax-induced alterations in overall economic activity. A hard-and-fast assumption in all official estimates of the revenue effects of tax changes is that the tax changes, no matter how substantial never have the slightest impact on overall economic activity. Some of the aggregates that estimators specifically hold constant are gross domestic product (GDP), total employment, aggregate investment, market interest rates, and inflation. This zero-impact constraint guarantees that whenever a tax increase damages the economy's performance, the official revenue estimate will tend to overpredict the government's

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[6] This study focuses on feedback effects on tax revenues that are excluded from official estimates, but the feedback effects of tax changes may affect government spending, as well. Higher income tax rates tend to elevate market interest rates, including what the Treasury must pay on government borrowing. Higher income tax rates also exert upward pressure on wage rates, including those of government employees.

[7] See CBO Paper, *op. cit*., p. 3.

revenue gain; conversely, whenever a tax decrease helps the economy, the official revenue estimate will tend to exaggerate the government's revenue loss.

In appraising the revenue effects of tax changes, the government's estimators are willing to examine how behavioral responses that the estimators deem to have no effect on the economy's aggregate performance may feed back on tax revenue. For example, the estimators assumed that the higher top individual tax rates enacted in 1993 would not cause anyone to work fewer hours or to save less and would not in any way weaken the economy, even though the tax increases targeted precisely those people who are the most productive, make especially large contributions to the nation's saving, and very likely are the most responsive to tax changes.

The estimators did acknowledge, however, that the legislation would lead individuals subject to the higher rates to buy more tax-exempt municipal bonds and to direct a larger share of their compensation from wage income into tax-exempt or tax-deferred fringe benefits. Even in this respect, however, government estimators often give short shrift to behavioral responses, either by minimizing the size of the responses or by leaving some responses out of the analysis altogether. Again, the upshot is that the government's official revenue estimates systematically inflate both the added revenues from tax increases and the revenue cost to the U.S. Treasury of tax reductions.

The primary reform sought by critics of the current estimating methodology is an end to the unrealistic exclusion from all official revenue estimates of macroeconomic effects resulting from tax-induced behavioral changes. Revenue estimates would be more accurate, hence, better guides for policymakers if they took account of these macroeconomic effects.

On this issue government estimators refuse to yield. Joined by various supporters, they insist that fully dynamic revenue estimates are impractical and risky. The CBO laid out many of these defenses for the revenue-

estimating *status quo* in a paper released in January 1995.[8] According to the CBO, estimates freed from the artificial macroeconomic constraint "could provide more accurate information to the Congress in certain situations but would raise some serious practical difficulties... The current estimating approach, in contrast, has the advantages of relative simplicity, timeliness, and consistency."[9] A week later in testimony before a joint hearing of the House and Senate Budget Committees, the JCT endorsed the CBO's conclusions and briefly reiterated several of them.[10] A careful examination of the CBO's and the JCT's points, however, reveals that most of them depend on turning a blind eye to flaws in the current revenue estimating methodology or setting impossibly high standards for fully dynamic revenue estimates.

A secondary reform that critics have demanded and the JCT has recently promised to begin implementing is relaxation of the secrecy that has surrounded the assumptions and models used in deriving revenue estimates. The secrecy, critics charge, has often shielded blatantly unreasonable or erroneous assumptions and procedures from proper scrutiny.

Present Methodology

Estimates of budget receipts under existing tax law and under proposed tax changes are produced in the executive branch by the staff of the Treasury Department's OTA. In the legislative branch, the CBO, often with substantial help from the JCT, prepares revenue estimates early each year and updates them later in the year as part of its assessment for the Congress of the budget

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[8] *Ibid.*, p. 3.

[9] *Ibid.*, p. 20

[10] Joint Committee On Taxation, *Written Testimony Of The Staff Of The Joint Committee On Taxation Regarding The Revenue Estimating Process*, presented to the Joint Hearing of the House and Senate Budget Committees, January 10, 1995.

outlook and the President's proposals.[11] For tax bills before Congress, the JCT is Congress's official scorer and prepares Congress's revenue estimates.[12] The JCT and the CBO may also prepare revenue estimates in response to Congressional requests for special studies.

Revenue estimates prepared in connection with the President's budget message and the Congressional budget resolution

The initial estimating efforts are undertaken in the executive branch in the preparation of the President's budget message; in the Congress, the initial efforts are called for as major inputs in the Congressional budget resolution.

Both in the executive branch and in the Congress, the estimates rely on assumptions about the course of the economy over the fiscal years in the budget projection period; these macroeconomic assumptions are important elements in estimating the bases of the various taxes imposed by the federal government. In both branches, it is recognized that changes in the economic baseline significantly influence the level of revenues that will be obtained under existing tax laws and under changes in tax provisions. In the executive branch, the OMB has authority for preparing the macroeconomic baseline, which it does with significant inputs from the Treasury Department. In the Congress, the CBO formulates the macroeconomic baseline. There is, however, a major difference in the tax and spending policies that the OMB and the CBO assume to be in effect when computing the macroeconomic baselines of the Administration and the Congress, respectively.

In connection with the President's budget message, the OMB estimates the economy's aggregate performance, as measured by such economic

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[11] In early 1995, for instance, the staff of the CBO's Tax Analysis Division prepared the current-law revenue estimates while the staff of the JCT did the estimates on the President's budget proposals. See Congressional Budget Office, *An Analysis Of The President's Budgetary Proposals For Fiscal Year 1996* (Washington, DC: Government Printing Office, April 1995), Preface.

[12] The CBO is Congress's official scorer for spending legislation.

magnitudes as GDP, personal income, corporate profits, employment and payrolls, the price level, interest rates, etc., taking account of the assumed economic effects of the tax and spending policy changes recommended by the President. The OTA then estimates the flow of tax revenues that will be generated on the new economic baseline.[13] These so-called "post-policy" revenue estimates, incorporating both the changes in tax and spending laws and the assumed effects on the economic baseline, are embodied in the projected budget results in the President's budget.

In contrast, the economic and budget projections that the CBO presents to the Congressional budget committees usually assume the continuation of existing laws. These "pre-policy" projections, therefore, do not take into account the effect on the economic baseline and on tax revenues of any tax revisions that may be considered. Usually the budget committees incorporate this macroeconomic baseline projection in the conference report on the Congressional budget resolution as if, contrary to fact, it reflected the effects on economic activity of whatever revenue and expenditure changes the

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[13] These are estimates of the amounts of tax revenues that the new tax laws will produce, given the *new* macroeconomic projections. The *change* in tax revenues (i.e., the revenue effect of the President's proposals) is difficult to interpret because of the bizarre method relied upon in the executive branch to calculate it. In essence, the revenue change is computed as the difference between 1) the level of revenues obtained from the *new* tax laws on the *new* economic baseline and 2) the revenues that would be obtained under the *existing* tax laws on the *new*, not the old, baseline. To illustrate, suppose the baseline economic projection of GDP, assuming existing tax laws, for year 1 in the budget projection period is $6.0 trillion, and that at that income level, existing tax laws would generate revenues of $1.20 trillion. Suppose further that the OMB estimates that the President's proposed tax changes would alter the baseline, so that with the new tax laws GDP in year 1 would be $6.2 trillion and that at that income level, the *existing* tax laws would produce $1.24 trillion in revenues. With the *new* tax laws, however, the estimated amount of revenues is $1.23 trillion. One might well conclude that the revenue effect of the proposed tax change is the difference between the amount of tax receipts under the new law and the amount of those receipts if the law weren't changed (a *gain* of $30 billion = $1.23 trillion - $1.20 trillion). Under the method actually employed, however, the estimated revenue effect is a *loss* of $10 billion ($1.24 trillion - $1.23 trillion).

resolution calls for. The CBO declares, "In most years, the macroeconomic effects of the policies implicit in the budget resolution would be small over the five-year budget horizon, so the practical difference between a pre-policy and a post-policy forecast would not be significant."[14]

It is not clear how either the CBO or the OMB prepares its projections of economic baselines nor how the OMB estimates the macroeconomic effects of the President's policy proposals. It is likely that a high degree of subjective judgment, influenced by the simulation results produced by the various econometric models at these staffs' disposal, are relied upon in producing the economic baseline projections and any changes therein.

In any event, the budget estimates included in the President's budget submission are based on the *new* macroeconomic projections that supposedly reflect the effects of the President's proposed policy changes. The CBO's estimates of budget items, however, use *existing-law* macroeconomic projections. If the Congress incorporates the CBO's macroeconomic baseline in its annual budget resolution without modification, which usually happens, the budget resolution contains *existing-law* macroeconomic projections.[15] That contradicts the CBO's assurance that policy changes' "macroeconomic effects are considered [in the budget resolution]....The current practices are consistent with the whole set of policies in the budget resolution and give a clear picture of their budgetary effects..."[16]

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[14] CBO Paper, *op. cit.*, p. 4.

[15] Congress sometimes alters this, though. As part of the 1990 budget deal, for instance, Congress told the CBO to rework its forecast to include the macroeconomic benefits that would supposedly flow from the budget agreement, which raised taxes, promised to lower the growth rate of federal spending, and claimed to reduce future budget deficits. (The revised forecast was much too optimistic, as later events revealed, because of the recession that commenced in 1990.)

[16] *Ibid.*, p. 5.

Revenue estimates prepared in connection with bills before Congress

Once revenue bills are presented in Congress, it becomes the JCT's responsibility to provide Congress with its official revenue estimates. According to the JCT, these revenue estimates "measure the anticipated changes in Federal receipts that result from proposed legislative changes to the Internal Revenue Code or related statutes."[17] In the executive branch, the OTA prepares estimates on many revenue proposals. The Administration may use these results internally or, if it chooses, share them with Congress. Much formal and informal consultation occurs between the staffs of the JCT and the OTA.

The first part of the estimators' task is estimating the current-law revenue baseline: how much would the government collect under current law in the absence of the tax change (or changes) being evaluated. The second part is estimating federal revenues assuming enactment of the tax change (or changes) under consideration. The revenue estimate is then the difference between estimated revenues under current law and estimated revenues with the tax change (or changes).

In deriving the current-law revenue baseline, the estimators, of course, need a macroeconomic baseline because the estimate extends several years into the future, and the condition of the economy strongly influences revenues. Legally, the JCT must use the macroeconomic projection contained in the Congressional budget resolution. Congress usually, but not always, adopts the CBO's macroeconomic projection, which, as mentioned earlier, is generally a "pre-policy" projection: it projects the economy's performance in future years assuming current laws remain in place. The OTA usually relies on the Administration's macroeconomic baseline.

To help them in estimating the current-law revenue baseline, given the economic baseline, federal estimators have gathered information from the Internal Revenue Service (IRS) and other sources detailing characteristics of individuals and businesses that are relevant in determining their taxes. With

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[17] JCT Testimony, *op. cit.*, p. 2.

the individual income tax, which is the largest federal tax, government estimators base their results on a large, computerized sample of representative individual taxpayers.

Next, JCT and OTA estimators substitute into their calculations the tax change in question and repeat the entire process. Their first step in calculating the revenue effect of a proposed tax change is to ask how many taxpayers are subject to the change and how the change would affect the taxpayers' tax rates, tax bases, and, hence, tax liabilities. In some instances the estimators take account of some of the behavioral adjustments that people make when tax changes alter the relative prices and costs they face, that is, their incentives. Estimators limit the behavioral adjustments they consider, however, to what the CBO calls "microeconomic effects", adjustments that have no impact on the economy's performance.[18] Estimators specifically exclude from their models all of the effects on aggregate economic activity to which these behavioral responses might lead: "[E]stimating conventions utilized by the OTA staff and the Joint Committee [on Taxation] staff assume no overall effect on economic aggregates such as gross domestic product [from the particular tax change being evaluated]..."[19]. Estimators do this by using the same macroeconomic assumptions when estimating revenues with the tax change that they had used when estimating revenues in the baseline case.[20] Consequently, estimators exclude from their models the tax base changes and resulting changes in tax revenues that result from tax-initiated

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[18] CBO Paper, *op. cit.*, p. 2.

[19] JCT Testimony, *op. cit.*, p. 9.

[20] The JCT's macroeconomic assumptions, as mentioned previously, usually come from the CBO's "pre-policy" macroeconomic baseline, while the OTA generally uses the Administration's "post-policy" macroeconomic baseline.

changes in macroeconomic activity.[21] When tax changes are targeted at noncompliance or, conversely, are "difficult to enforce or administer," revenue estimators may also adjust for the anticipated improvement or worsening of compliance.[22] Estimators also adjust for mechanical interdependencies among taxes, whereby tax payments for one levy sometimes automatically modify how much taxpayers owe for other levies.

For example, suppose the estimators are evaluating a proposal to increase the federal gasoline excise tax. They would begin with the current-law revenue baseline. Then, to determine how the increased excise would alter the baseline, they would first ask what gasoline sales would have been during the years of the budget window if household and business purchasers of gasoline did not change their behavior in response to the higher tax. In making that prediction, estimators would probably look at the trend of gasoline sales over time, perhaps modifying that in light of growth assumptions in the macroeconomic baseline.[23]

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[21] This procedure regarding individual tax bills is inconsistent with how Administration estimators treat the President's budget proposal. Although federal estimators assume that revenue bills have no macroeconomic effects when they are introduced in Congress and estimated individually, Administration estimators assume that tax and spending recommendations in the President's budget proposal do have macroeconomic effects.

[22] *Ibid.*, p. 7. The JCT cites anticipated underreporting of the value of employer-provided parking as a tax evasion problem it factored into a revenue estimate. But although estimators do consider compliance in a few cases, it is not clear that they give much weight to compliance and enforcement, in general. If so, their estimates routinely shortchange what may often be a significant effect.

The JCT observes that adjusting for compliance "represents another aspect of taking into account behavioral effects." (See *Ibid.*, p. 8.) After all, when a tax change raises (lowers) tax rates, it increases (reduces) the attractiveness of evading taxes.

[23] For instance, if taxable gasoline sales have been expanding 6 percent annually but the macroeconomic baseline assumes that the economy will grow more slowly in coming years, the estimators might scale down their projection of the growth rate of gasoline sales to 5 percent.

Next, estimators would acknowledge that the higher tax would discourage gasoline use by raising its relative price. The magnitude of the sales loss would depend on the size of the tax increase, the sensitivity of household and business purchasers to gasoline's price (their price elasticity of demand), and on the conditions of supply.[24] This negative feedback loop somewhat lessens the rise in tax collections because when the higher tax causes households and businesses to cut back on gasoline purchases, fewer sales than otherwise remain on which to assess the tax. In other words, a tax-induced reduction in the quantity of sales partially offsets the higher tax the government collects on each sale. Official revenue estimates account for such changes in gasoline consumption behavior and the effect of the change on gasoline excise revenues. These revenue estimates are dynamic to the extent that they take account of direct, or own-market, behavioral responses to the tax changes.

Finally, government estimators would consider whether the higher gasoline excise tax would interact with the assessment bases of other taxes. In this instance, the estimators' stipulation that the tax does not alter nominal GDP forces them into the further assumption that somehow the tax produces offsetting changes in the sizes of nominal GDP's components. According to the CBO, "JCT also recognizes that a higher excise tax would increase nominal GDP by raising the price of the taxed good. Therefore, JCT's estimates assume that income falls in order to maintain GDP at the level assumed in the budget resolution, and that income and payroll tax receipts shrink accordingly."[25]

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[24] Although sellers might absorb some of the tax via lower net-of-tax prices, government estimators apparently assume that sellers pass the entire excise tax forward to buyers. (See CBO Paper, *op. cit.*, p. 10.) To explain elasticity with a simplified numerical example, suppose the government imposes a 10 percent tax and that buyers have a price elasticity of demand of 0.5 (they reduce their purchases by 0.5 percent for every 1 percent increase in price.) If the tax is passed completely forward, buyers will respond to the 10 percent price hike by purchasing a 5 percent smaller quantity than otherwise.

[25] *Ibid.*, p. 10.

As another example of the official revenue estimating methodology, consider a proposal to increase the tax rate on the employer share of the payroll tax. Estimators would start with the revenue baseline. They would then forecast the trend in taxable payroll and apply to it the higher payroll tax rate, assuming no adverse reaction by employers or employees to the higher tax. At most, they might possibly allow for some compositional shifts, such as employers' shifting some compensation from taxable wages to tax-exempt fringe benefits.

In fact, employers would view the tax hike as increasing the cost of labor and would try to counteract the tax by reducing growth in wages and other components of workers' compensation packages. Some workers would resist this backward shifting and, consequently, either work fewer hours or become unemployed.[26] Estimators, however, disregard this negative labor-supply response because they carry the macroeconomic constraint down to the individual level, insisting it means that every worker provides the same amount of labor as before, notwithstanding the higher tax. Hence, although a reduced labor supply would be a direct own-market behavioral response to the higher payroll tax, estimators exclude it from their model.[27] They also assume all other macroeconomic variables are unaffected by the stiffer payroll tax. With regard to interconnected tax bases, the employer share of the payroll tax is a deductible business expense in calculating a business's taxable income under the income tax. Accordingly, estimators would predict

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[26] Second and third wage earners in households would be most likely to reduce their work efforts. They are fairly sensitive to the prices they receive for their services; in technical language, they have relatively high price elasticities of supply.

[27] The JCT writes that its "staff does not attempt to forecast changes in labor supply resulting from changes in income tax or payroll tax rates." (JCT Testimony, *op. cit.*, p. 10.) The JCT rationalizes this application of the macroeconomic constraint by opining that although some people might work less following a tax increase, others might work more to preserve their after-tax incomes.

that raising employers' payroll tax rate would cause businesses to report lower taxable incomes, resulting in a decline in income tax collections.[28]

What Is Wrong with Current Revenue Estimation Procedures?

Predicting the government's future revenue stream and how changes in tax law would alter that stream are highly technical undertakings. Errors in revenue estimates are virtually unavoidable because many of the variables and relationships on which the estimates depend are not known with certainty. For instance, if a tax code change turns out to affect a substantially different number of taxpayers than estimators had expected, a common occurrence, that can easily throw off a revenue estimate. Revenue estimates have been persistently controversial, however, not because of errors like this, which are due to genuine uncertainties and are largely unavoidable, but because of procedures that inject preventable mistakes into revenue estimates.

The area in which critics charge that avoidable mistakes do occur is modeling how people adjust their behavior following tax changes. Tax changes can, and often do, generate large shifts in the relative prices and costs that people face as producers and consumers. In response to those changes in relative prices and costs (i.e., in incentives), people often find it sensible to modify their behavior. These tax-induced changes in behavior frequently affect the tax base. As a result, tax-induced behavioral shifts are important determinants of the effects of tax changes on government revenues because the amount that a tax collects depends not only on the rate of tax but also on the base on which the tax is assessed.

When the government changes a tax so as to move tax collections in one direction, the ensuing relative price changes generally prompt people to change their behavior in ways that push the tax base and, thus, tax revenue

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[28] For example, if a business with a marginal income tax rate of 35 percent must pay an extra $100 in payroll tax, its income tax base will fall by $100 and its income tax liability will drop by $35, offsetting about one-third of the apparent revenue gain from the higher payroll tax rate.

in the opposite direction. Sometimes people's responses change the quantity or price of the taxed activity, leading directly to changes in the tax base and, hence, tax revenue. Sometimes people's responses cause changes in overall economic activity, and the tax-induced changes in economic activity then alter the assessment bases of many taxes, leading to what are called macroeconomic revenue feedbacks. The change in government revenue often is in the direction that the government anticipates, but by less than otherwise because of people's behavioral adjustments. In some cases, however, the behavioral reactions are so powerful that lower taxes actually gain revenue while higher taxes lose revenue. Over two centuries ago, Adam Smith cautioned in comparing revenues under moderate versus very high customs duties (taxes the government assesses on imports), "[I]n the arithmetic of the customs two and two, instead of making four, make sometimes only one..."[29]

Revenue estimators do not entirely ignore behavioral responses and the resulting shifts in the tax base. The extent to which revenue estimators include behavioral responses in their models, however, is grossly inadequate.

Revenue estimates prepared in connection with the President's budget message and the Congressional budget resolution

When the OTA projects how much revenue the federal government would collect if the President's budget proposals were adopted, it bases its forecast in part on the OMB's estimates of the effects of the proposed policy changes on the macroeconomic baseline. Thus, the accuracy of the Administration's revenue forecast depends on how accurately the Administration predicts the economy's future performance.

The macroeconomic effects of proposed policy changes, however, are not estimated on the basis of a close, consistent analysis of how those policy changes would affect relative prices and costs, how people would respond to those price and cost changes, and how those behavioral responses would affect aggregate economic activity. The way in which the Administration

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[29] Adam Smith, *An Inquiry Into The Nature And Causes Of The Wealth Of Nations* (New York: The Modern Library, 1965), p. 832.

estimates how the President's budget proposals would affect the economy, instead, is arbitrary, highly subjective, and secretive. The Administration's "post-policy" macroeconomic baseline would have a much sounder foundation and carry more credibility if it were not obtained in such a casual, informal manner but derived from a more rigorous analysis.

When the CBO and the JCT advise Congress on how much revenue the government would collect under existing law, the President's budget proposals, and the Congressional budget resolution, they usually assume that economic aggregates will be at the levels projected in the CBO's macroeconomic baseline. This assumption would be valid and useful for estimating purposes only if it could be established that the behavioral responses of households and businesses to policy changes are negligible during the budget projection period. Government estimators provide no solid evidence or analysis to validate this counter-intuitive, counter-factual assumption.

Hence, in the legislative branch, estimates of the federal revenue stream if the President's budget submission or the Congressional budget resolution were enacted are deficient in that they ignore all feedbacks from the proposals' tax changes to the economy's performance and back to tax revenues. To correct this failing, the CBO's macroeconomic baseline would need to take account of the impact on the overall economy of the set of policy changes being considered.

The Congressional budget resolution does not specify the tax changes, if any, that are to be enacted by the tax-writing committees. Lacking such specification, the CBO cannot, even if it were so inclined, estimate correctly the macroeconomic effects of the tax changes. That estimate, as well as that of the consequent revenue changes, should be deferred until the tax-writing committees produce a list of proposed tax changes.

Revenue estimates prepared in connection with bills before Congress

When federal revenue estimators try to gauge the revenue consequences of tax bills before Congress, they include in their estimates selected "microeconomic" or "direct" - own market - behavioral feedbacks, but they categorically assume that the proposed legislation would have no effect on overall economic activity, notwithstanding the obvious lack of realism in that assumption.

In the example of an increase in the gasoline excise tax, JCT or OTA estimators would factor into the estimate a decline in gasoline sales due to the tax-related increases in gasoline's production cost and its price but would recognize no detrimental effect of the tax increase on the economy's performance. Contrary to the estimators' methodology, however, the drop in gasoline sales would hurt the economy via two pathways. First, gasoline is an important production input for much of the U.S. economy. If business purchasers use less gasoline in production because the tax has made it more expensive, they must either rely on less efficient energy inputs or cut back on production or both. Second, reduced gasoline sales would reduce the labor and capital needs of businesses involved in supplying gasoline, from oil drillers to service stations. Unless or until the labor and capital displaced by the tax could find equally productive and well paying employment in other industries, output and incomes would fall. The estimators' zero-impact macroeconomic constraint, however, rules out of bounds identification of any such tax-generated effects on the economy.[30]

In this example, an internal inconsistency in the current methodology also arises. Despite the estimators' claim that "all revenue estimates assume fixed levels of macroeconomic aggregates,"[31] the estimators actually vary a major

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[30] For an extended discussion and analysis of the aggregate economic effects of an increase in the gasoline excise tax, see Norman B. Ture, Carlos Bonilla, and Stephen J. Entin, *The Impact, Shifting, And Incidence Of An Increase In The Gasoline Excise Tax* (Washington, DC: Institute For Research On The Economics Of Taxation, 1992).

[31] JCT Testimony, *op. cit.*, p. 19.

aggregate, national income, in an entirely arbitrary and mechanical fashion. To enforce the assumption that the tax change has no effect on nominal GDP, the estimators find themselves compelled to assume that national income falls by precisely the same amount as excise tax revenues increase.[32] The estimators do not explain how national income is supposed to decrease; they just assume without analysis that it does.[33] What the estimators should admit is that sometimes they cannot simultaneously hold all economic aggregates fixed with respect to tax changes. Rather than using arbitrary, no-think rules for deciding which aggregates to adjust and by how much, they should develop an economic model that would actually analyze what the adjustments are likely to be.

The official revenue estimation methodology strains credulity at least as much in the illustrative case of a higher payroll tax. Although employment would certainly drop in direct response to the tax, the official methodology claims a payroll tax increase, no matter how large, can never reduce total employment (nor even decrease the amount of labor supplied by any individual worker) and can never inflict any damage on the aggregate economy. Thus, in the official methodology, the payroll tax increase has no negative macroeconomic behavioral effects whatsoever to feed back on and

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[32] Due to the arithmetic of the National Income and Product Accounts (NIPA), it is not possible for an excise tax to change the amount of indirect business taxes (which includes a gasoline excise) without altering either nominal GDP or national income; because nominal GDP in the NIPA is the sum of indirect business taxes and national income, something has to give. Estimators use the mechanical rules that the excise tax 1) does not affect nominal GDP and 2) somehow produces exactly offsetting movements in the indirect business tax and national income components of nominal GDP.

[33] A further contradiction involves prices. Estimators assume the higher excise tax is fully passed forward to consumers, meaning that gasoline's price rises by the amount of the tax increase. However, estimators also assume that the excise tax does not affect the quantity of production. Thus, it does not affect total real output. But for real output to remain constant while national income drops, prices can't rise by the amount of the tax increase.

depress tax collections. In reality, of course, the higher payroll tax would raise employers' labor costs and employees' costs of working relative to other uses of their energy, resources, and time. The result would be a reduction in employment. With less employment than otherwise, total production and aggregate income would also fall. These detrimental macroeconomic effects, in turn, would erode tax revenues by reducing the assessment bases of many taxes, including the payroll tax itself.

Critics also charge that although official estimates include direct, or own-market, behavioral effects, those effects frequently receive too little weight in revenue estimates. One of the most publicized cases concerns the capital gains realizations effect, with critics asserting that a lower capital gains tax rate would induce a much greater pick up in taxable sales of capital assets than estimators acknowledge. Critics also point out that this tax change would have other direct and indirect effects, ignored in the official estimates, that could materially affect revenue outcomes.

Critics often describe government estimates of the revenue effects of tax changes as static rather than dynamic, because of the limited extent to which the estimates measure the economic feedback effects that result when individuals and businesses respond to tax-induced changes in relative prices and costs. The static-versus-dynamic terminology is somewhat confusing, though. The current methodology of the JCT and the OTA is not completely static in that it does acknowledge a limited set of behavioral reactions. Thus, the JCT has a point when it declares, "[R]evenue estimates prepared by the Joint Committee staff are not static, as has been frequently suggested."[34] But the current methodology is certainly not fully dynamic in that it assumes taxes never affect economic aggregates and frequently slights own-market reactions. Hence, the JCT overreaches when it describes its models as dynamic: "The Joint Committee staff's estimates are dynamic to the extent they take account of the direct behavioral responses that can be expected

[34] *Ibid.*, p. 5.

from the proposed changes in the tax laws."[35] Official revenue estimates are completely static with respect to tax-induced growth effects and often not sufficiently dynamic with regard to own-market behavioral effects.

To put this in perspective, consider a scale of one to ten. If completely static estimates are rated one and fully dynamic estimates are rated ten, the present methodology would probably merit a score of two or three. With an excise tax, for instance, estimators would consider a significant own-market behavioral effect: a change in the quantity of the taxed item's sales due to the tax-induced change in its price. But in following the government's revenue estimation methodology, estimators would fail to account correctly for macroeconomic behavioral effects, which can sometimes account for substantial revenue feedbacks. With income and payroll taxes, which are the federal government's main revenue sources, the inadequacy of the current methodology is especially glaring because estimators interpret the macroeconomic constraint to imply that people never work and save less because of higher income or payroll tax rates nor work and save more if those rates are lowered. In judging government estimates of the revenue consequences of the individual income tax increases enacted in 1993, Feldstein concluded:

> "Although the official revenue estimating staffs claim that their estimates are dynamic because they take into account some taxpayer behavior, the 1993 experience shows that as a practical matter the official estimates are close to being `static' no-behavioral response estimates because they explicitly ignore the effect of taxes on work effort and grossly underestimate the magnitude of other taxpayer responses."[36]

Another way of viewing the current revenue estimating methodology, based on its treatment of behavioral feedback effects, is in terms of what is

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[35] *Ibid.*

[36] Martin Feldstein, "What the '93 Tax Increases Really Did," *The Wall Street Journal*, October 26, 1995, p. A22.

known as partial equilibrium economic analysis. Partial equilibrium analysis examines specific markets (or groups of closely related markets) without measuring interactions among the markets being studied and the rest of the economy. A partial equilibrium analysis would not evaluate how resources released or absorbed by the markets being studied affect prices, output, and incomes in the rest of the economy. General equilibrium analysis, on the other hand, draws links between actions in specific markets and the general economy.

Consider a partial equilibrium analysis of the consequences of a tax change. Taxes have incentive effects because they change market relationships among prices and among costs. A higher tax makes a taxed product or activity more expensive relative to other products and activities, and that greater relative cost discourages its production and consumption. Conversely, a lower tax reduces the relative cost of a taxed product or activity, encouraging its use. Partial equilibrium analysis would examine the impact of the price change on output, employment, labor compensation, capital returns, and other variables in the taxed market and perhaps closely related markets. It would not, however, extend the analysis to the rest of the economy, assuming implicitly that the market in question is independent from other parts of the economy. It would ignore, for example, the fact that an increase in the tax on capital returns in the taxed market would depress after-tax returns to capital throughout the economy and adversely affect aggregate capital formation.

The current revenue estimating methodology uses the tools of partial equilibrium analysis but then superimposes the macroeconomic constraint on the results of that analysis. To return to the gas tax example, when government estimators consider how a higher gasoline excise would affect federal revenues, they incorporate in their estimate some own-market behavioral effects: the increased tax raises gasoline's price and that lowers the volume of gasoline sales. The tax-induced sales drop contracts the tax base, causing some slippage in the revenue gain. That is a classic partial equilibrium analysis. And, as is typical in a partial equilibrium model, there is no *formal* analysis of effects on the rest of the economy.

The estimators quite strictly adhere to this partial equilibrium approach in superimposing the stipulation that whatever effects the tax change may have on the taxed market, it has no effect on the economy's performance. For example, the government's official revenue estimators always assume that whenever a tax change displaces inputs, production, and sales from one sector of the economy, the inputs simply migrate to other sectors of the economy with no changes in either the quantity of inputs or their productivity.

The estimators, however, do not derive the supposition that taxes have no impact on the general economy from their partial equilibrium economic analysis. It is a supposition from outside the analysis that estimators impose on their results. Thus, one can characterize the government's official revenue estimation methodology as partial equilibrium analysis subject to an outside, *a priori* macroeconomic constraint. The main weakness of this approach is that if the *a priori* assumption deviates from reality, which it often does, so will the estimators' results. Another weakness is that when it is not possible for estimators to hold all economic aggregates unchanged, they arbitrarily - without any economic evaluation - assume which ones adjust.

Assessing Defenses of the Current Methodology

Backers of the current methodology, while admitting that its assumptions and procedures are not perfect, contend that it is superior to any other methodology now achievable. The JCT proclaims that the present methodology reflects efforts "to consistently produce accurate estimates that can be reasonably relied upon by Members of Congress in making legislative decisions" and that are "viewed as fair and impartial."[37] The JCT avers also that it "is dedicated to continually improving its estimating methodology to enhance the accuracy of its work product"[38] "For the vast majority of bills

[37] JCT Testimony, *op. cit.*, p. 1.

[38] *Ibid.*, p. 1.

the Congress considers," says the CBO reassuringly, "these estimating conventions are accepted and noncontroversial."[39]

The CBO correctly observes that dissatisfaction with the methodology centers on its treatment of behavioral effects. "First, estimators sometimes differ in their assumptions about the size of the microeconomic responses.... Second, although enactment of some proposals might affect the overall economy, the estimates traditionally exclude macroeconomic effects."[40] With regard to the first point, though, the CBO insists that the methodology's handling of own-market price effects is thorough and of the highest quality. "[B]udget estimates are...based on numerous assumptions about the microeconomic effects of the proposed policies...These behavioral and other technical estimating assumptions cover a wide variety of effects and reflect recent research and the best available estimating practices."[41] The examples cited here belie this hyperbolic assertion.

As for macroeconomic behavioral effects, the CBO concedes, "In theory, estimators could incorporate macroeconomic effects into budget estimates, thereby providing more information to the Congress and a more comprehensive basis for pay-as-you-go scoring."[42] The CBO and other advocates of the present methodology claim, however, that for most tax proposals macroeconomic effects are sufficiently small and slow to appear that they can safely be ignored. Further, defenders of the *status quo* insist that including macroeconomic effects in revenue estimates would "in practice ... raise several difficult issues."[43] Supposedly, the adjustments needed to bring macroeconomic effects into revenue estimates are too costly and time

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[39] CBO Paper, *op. cit.*, p. 2.

[40] *Ibid.*, pp. 2-3.

[41] *Ibid.*, p. 2.

[42] *Ibid.*, p. 3.

[43] *Ibid.*.

consuming, too controversial, and would create too many opportunities for cooking the books. Moreover, opponents of changing the current methodology assert that if estimates incorporate macroeconomic effects, they should also include several other types of effects, some of which would be controversial, difficult to estimate, or misleading.

How can the deliberate exclusion of macroeconomic feedback effects from existing estimation systems be justified? The CBO and other defenders of the status quo present a variety of defenses. While they are correct that building macroeconomic feedback effects into estimation systems is more complicated than leaving them out, most of their arguments rely either on glossing over shortcomings in current procedures or demanding virtual perfection from estimates incorporating macroeconomic feedbacks.

Macroeconomic effects of tax changes are too controversial to be included in revenue estimates. According to the CBO:

> "[E]conomists often have widely divergent views about the magnitude and timing of the macroeconomic effects of policy changes. Thus, expanding the scope of macroeconomic effects to be included in budget estimates could add to the uncertainty and controversy surrounding some estimates and might risk undermining the credibility of all estimates."[44]

It is certainly true that economists are not of one mind regarding how changes in public policies and government activities affect the economy's performance. Some believe that behavioral responses by individuals and businesses to government-induced changes in relative prices and costs are

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[44] *Ibid.*, p. 12. In the quote, the CBO describes adding macroeconomic feedbacks to estimation models as "expanding the scope of macroeconomic effects to be included in budget estimates." That phrasing is deceptive. Current estimation models attempt to exclude behavioral macroeconomic feedbacks. (As discussed in the case of a gasoline excise tax, estimators sometimes include macroeconomic effects in their results, but do so in an arbitrary, mechanical way that is inconsistent with their methodology.)

inconsequential or nonexistent, hence, cannot generate any significant impact on the overall economy.[45] Members of this group are suspicious of any revenue estimate pointing to large macroeconomic behavioral feedbacks. In contrast, other economists think household and business decision makers continually respond to changes in relative prices, whether the changes result from government or private market operations. Members of this group do not insist that macroeconomic behavioral responses are always large, but they are troubled that the current official revenue estimating methodology presumes in every case that macroeconomic behavioral effects are inconsequential or nonexistent.

Another, often related disagreement concerns Keynesian versus neoclassical analyses of the effects of government activity on the economy. Many of those who think incentive effects are small and uncertain are disciples of Keynesian economics. The Keynesian approach downplays relative price, or incentive, effects, while claiming that government fiscal and monetary policies can profoundly influence the economy in the short term by altering total demand in the economy. In contrast, those who rely on the neoclassical analysis think incentives often exert large, predictable, and long-lasting effects on economic activity. The neoclassical approach is based on the theoretical and empirical analysis of how people, as producers and consumers, adjust their economic decisions in light of the relative prices and costs they confront. Whereas neoclassical economics holds that incentive effects will often be powerful, it finds numerous holes in Keynesian theory and, accordingly, is dubious about the conclusions the Keynesian model reaches.[46]

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[45] Typifying this position is the view that individual saving behavior is not influenced by the returns that may be obtained per dollar of saving (i.e., that saving is completely interest inelastic.)

[46] For an engaging discussion of the differences between the views, predictions, and policy prescriptions of neoclassical and Keynesian economics, see Lawrence Lindsey, *The Growth Experiment: How The New Tax Policy Is Transforming The U.S. Economy* (New York, NY: Basic Books, 1990), especially ch. 1. For an early, rigorous examination of the differences between neoclassical and Keynesian analytics, see

Although the CBO is correct that economists disagree about the importance of macroeconomic behavioral effects, much of its argument rests on the false premise that current estimating rules are noncontroversial. According to this premise, the absolute exclusion of macroeconomic behavioral feedbacks from official estimation models, regardless of all countervailing evidence, does not generate "uncertainty and controversy" and does not "risk undermining the credibility of all estimates." In fact, though, the current rules are extremely contentious. That is why the House and Senate Budget Committees took the dramatic step in January 1995 of holding a joint hearing to examine whether the existing estimating methodology should be modified. If current practices reflected a consensus among economists and policymakers, the committees would probably not have held the hearing. Controversy cannot be avoided. The choice is between alternative methodologies.

Perhaps the CBO is suggesting in its argument about the lack of a consensus that some economists' claims of substantial macroeconomic feedbacks should be ignored because other economists disagree. If so, the CBO is applying a much more rigid rejection criterion than is normally used in assessing theories. Disputes among researchers are very common. Just because the theories of one group of researchers are disparaged by another group does not mean the theories are necessarily wrong or can safely be dismissed out of hand. On the contrary, disputes among researchers are often helpful in clarifying ideas and often indicate the rethinking of ideas that is a hallmark of scientific advance.[47] In economics, if theories had to be disregarded unless they garnered almost unanimous approval, not only would the introduction of new (and often improved) theories become virtually

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Norman B. Ture, "Supply Side Analysis And Public Policy," in *Essays In Supply Side Economics*, edited by David G. Raboy (Washington, DC: Institute For Research On The Economics Of Taxation and The Heritage Foundation, 1982.)

[47] The Nobel-prize-winning economist Robert E. Lucas provides an eloquent statement of just such a change in thinking concerning so-called "supply-side" economics. See Robert E. Lucas, "Supply-Side Economics: An Analytical Review," *Oxford Economic Papers*, April 1990, pp. 293-316.

impossible, but most present economic thinking would have to be declared out of bounds, as well. Indeed, if the paramount objective were to sidestep disagreements, no revenue estimates would be permissible; all would be too controversial.

Further undercutting CBO's position is the fact that many partial equilibrium effects are themselves very controversial regarding both their size and timing. If controversy does not deter estimators from estimating partial equilibrium effects (and they claim to do so), why should it bar them from estimating macroeconomic effects? In trying to dispose of this counterargument, the CBO first gives some ground. "[T]he assumptions about ... [macroeconomic] effects are not necessarily any less certain or more controversial among economists than some of the [partial equilibrium] behavioral assumptions that are currently included in cost estimates."[48] The CBO also admits, "The macroeconomic effects of some tax and spending policies have been extensively examined in the professional literature, which serves to delineate areas of agreement."[49] But, immediately, the CBO attempts to back away from what it has just conceded. "The [macro]economic assumptions still seem likely to attract more political controversy than CBO's and JCT's other assumptions. Even in the absence of a strong consensus among economists on macroeconomic effects, *estimators would have to make some kind of judgment about them* [if those effects were included in revenue estimates]." [emphasis added][50]

This does not explain, however, why the precedent set by partial equilibrium feedbacks should not apply. Again, many of those feedbacks are controversial, as the CBO acknowledges; yet, official estimators still manage to "make some kind of judgment" about their size and timing despite "the absence of a strong consensus among economists." Why can't the estimators do the same for macroeconomic effects? Notice, also, that the CBO is again

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[48] CBO Paper, *op. cit.*, p. 12.

[49] *Ibid.*.

[50] *Ibid.*.

putting forward the erroneous premise that the current methodology is benign, noncontroversial, and avoids having to reach any judgments regarding macroeconomic effects. In reality, current estimating rules already make a very strong "kind of judgment" about macroeconomic feedbacks, insisting they are always necessarily zero. Those who think macroeconomic feedbacks should be included in official revenue estimation models regard that judgment as factually wrong and think it imparts a definite political spin to current revenue estimates.

Another inconsistency in the current methodology involves its baseline. The Administration's macroeconomic forecast incorporates estimated macroeconomic effects, those predicted to be generated by the Administration's budget proposals. If macroeconomic predictions are really too controversial to make, what are they doing in the Administration's macroeconomic baseline? Conversely, if macroeconomic predictions are not too controversial to make when evaluating the macroeconomic effects of the entire budget package, including proposed tax changes, what makes them suddenly too controversial when evaluating the macroeconomic effects of tax changes considered singly?

To be sure, if macroeconomic feedbacks have little impact on actual revenues or revenue estimates have little impact on tax policy, those who object to the assumption, now inserted into every official revenue estimate, that macroeconomic effects are zero might not feel the issue is worth fighting about. The reason critics of the present methodology are not retreating is that they think macroeconomic effects are sometimes very important and fear that revenue estimates stripped of the tax feedbacks arising from those effects are often extremely deceptive and encourage very bad tax policy decisions.

<u>Macroeconomic effects are too small to bother about.</u> Some economists argue that the price and cost distortions generated by the tax system have very little impact on overall economic magnitudes like national output, wage rates, the number of jobs, and the price level. In their view, including macroeconomic feedbacks in revenue estimates would not gain much. The

JCT describes the issue as follows: "Most revenue proposals are likely to have little or no macroeconomic consequences."[51] To supporters of this position, the official assumption that macroeconomic feedbacks are zero is a harmless simplification that has the advantages of speeding along the estimation process and protecting estimators from mistakenly (in their view) estimating large macroeconomic effects in some cases.

The CBO does not explicitly develop this issue but briefly alludes to it, along with many others, when it argues that macroeconomic effects are too controversial for estimators to consider.[52]

The basic flaw in this argument is that although many tax changes would have only minor macroeconomic effects, others would have very large repercussions. Thus, the revenue estimating methodology should not assume that all tax changes would have trivial macroeconomic effects. A number of studies have concluded that some tax changes would have enormous impacts on economic activity and very substantial feedbacks on tax revenues. Consider some examples.

Robbins and Robbins, using a neoclassical, general equilibrium model they developed, analyzed several reforms to lower effective capital gains tax rates. One of the options was to set the maximum capital gains tax rate at 15 percent. Robbins and Robbins estimated that over the period 1994-2000, this rate reduction would produce a quasi-static federal revenue loss of $5 billion. (Their estimate included the realizations, or unlocking, effect.) However, they estimated that over the same period it would add $750 billion to GDP and yield a dynamic federal revenue gain of approximately $130 billion. To cite one of the other options they examined, they estimated that retrospective indexing of capital gains for inflation would carry a quasi-static revenue price tag over the period 1994-2000 of $11 billion but increase GDP over the same

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[51] JCT Testimony, *op. cit.*, p. 19.

[52] As previously quoted, the CBO report says, "[E]conomists often have widely divergent views about *the magnitude* and timing of the macroeconomic effects of policy changes." [emphasis added] (CBO Paper, *op. cit.*, p. 12.)

period by $1,100 billion and reap a dynamic revenue gain of over $190 billion.[53]

Using a broader brush, Scully looked at tax rates and output in a cross section of nations. His statistical analysis indicated that most countries are sacrificing a substantial amount of growth due to high tax rates and that, because of the growth effect, they could cut marginal tax rates substantially without incurring large revenue losses. "After 40 years, a country that maximizes economic growth [through low tax rates] will have almost the same government revenues as a country that tries to maximize tax collections [through much higher tax rates], and its citizens [will] have more than three times as much aftertax income."[54]

To be sure, many tax changes involve very small relative price changes, hence, have inconsequential incentive effects. Such tax changes have little impact on the economy, and relying on a dynamic, general equilibrium model would demonstrate the absence of any significant feedback effects on revenues. This sort of result does not militate against using an estimating methodology that identifies incentive effects of tax changes, the resulting macroeconomic consequences, and the revenue feedbacks where those effects are significant.

Macroeconomic effects have such long time lags that they should be ignored in budget estimates. The CBO report summarizes this view, but does not unequivocally endorse it, saying the time lag is long for capital but not labor.

> "Some analysts argue that including macroeconomic effects in budget estimates is not worth the trouble because the most interesting and

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[53] Gary Robbins and Aldona Robbins, "Putting Capital Back to Work for America," TaxAction Analysis Policy Report No. 124 (Lewisville, TX: TaxAction Analysis, 1994).

[54] Gerald W. Scully, "Tax Rates, Tax Revenues and Economic Growth," NCPA Policy Report No. 98, (Dallas, TX: National Center for Policy Analysis, 1991), Executive Summary.

> important effects - those on efficiency and on incentives to work and to save and invest - would generally not reach a significant size within the first five years (the budget window). Certainly, this assessment is correct for proposals that would alter incentives to save and invest. For example, reductions in taxes on capital increase the supply of capital only slowly....[But some] other policies would realize the full measure of their effects in a relatively short time. Changes in marginal tax rates on labor income, for example, would immediately affect the incentive to work...[T]here is some evidence that most of the adjustment would take place within two years."[55]

The CBO's assessment would imply that general equilibrium models are needed for tax changes affecting labor incentives, because the resulting macroeconomic feedbacks begin fairly quickly, but that current procedures are adequate for tax changes altering investment incentives, because supposedly investment changes only slowly in response to altered incentives and still more time must elapse before the changes in investment have much effect on production and incomes.

The CBO exaggerates the time lag with regard to capital, however. First, in a manner analogous to what the CBO describes for labor, less punitive taxation of capital will very quickly encourage greater and better directed use of the existing stock of capital, and that will boost output in a time frame similar to what the CBO expects from changes in the marginal tax rate on labor. Second, although increasing the stock of capital does take time, much of it occurs within the first five years. Those additions will begin increasing output and income and enhancing productivity within the budget window; they should not be dismissed out of hand. That is not to deny that still greater changes in the stock of capital may occur beyond the five-year budget window.

Robbins and Robbins found empirically that the real after-tax rate of return on capital is almost constant over time. That suggests the supply of

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[55] CBO Paper, *op. cit.*, pp. 12-13.

capital is extremely sensitive to its cost (i.e., highly price elastic) and adjusts rapidly. When tax reductions or other economic changes temporarily raise the after-tax return on capital, investors quickly add to their capital holdings and the increased supply of capital drives the after-tax rate of return down to its old level. Tax increases have the opposite effect, quickly leading to less investment and, as capital becomes scarcer, pushing back up the after-tax return. Robbins and Robbins report, "Most of this adjustment occurs after two years and all is completed within five years."[56] The Robbins's finding is powerful evidence that the adjustment period is short enough to be highly relevant within the budget window.[57]

Inclusion of macroeconomic feedbacks would open the door to political manipulation of revenue estimates. At present, official revenue estimators have no discretion in predicting the macroeconomic effects stemming from a tax change. They must assume all aggregate economic feedbacks are zero. Supporters of this constraint defend the resulting lack of flexibility as a virtue. It prevents estimators from exaggerating macroeconomic feedbacks to downplay the apparent budgetary cost of tax decreases.

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[56] Gary Robbins and Aldona Robbins, "Looking Back to Move Forward: What Tax Policy Costs Americans and the Economy," TaxAction Analysis Policy Report No. 127 (Lewisville, TX: TaxAction Analysis, 1994), p. 36. Also see Gary Robbins and Aldona Robbins, "Capital, Taxes, and Growth," NCPA Policy Report No. 105 (Dallas, TX: National Center for Policy Analysis, 1992).

[57] Although macroeconomic effects are important within the budget window, a longer-term perspective would reveal that the effects continue to build over time. One method of accounting for such longer-term effects is present-value budgeting, in which budget effects are estimated far into the future and then discounted by an appropriate interest rate to find their present value. Present-value budgeting can be extremely revealing even if macroeconomic effects are totally excluded. Estimates confined to the budget window may well produce deceptive results because of timing factors. For example, a longer budget horizon discloses that accelerated depreciation has a much lower budget cost than standard revenue estimates suggest because larger capital recovery allowances in the early years imply smaller deductions in later years. Similarly, even in an entirely static revenue-estimation model, most of the near-term revenue cost of IRAs is offset by large future taxable distributions from the IRAs.

This is a troubling charge and it does allude to a legitimate concern. Would revenue estimators develop their own agendas of favored and disfavored tax revisions and misrepresent their revenue effects accordingly? Or would the revenue estimators be more inclined than at present to accommodate the preferences of policymakers merely because they introduced macroeconomic effects? The CBO warns that if estimates of macroeconomic feedbacks were not constrained, those estimates would be particularly vulnerable to abuse because of uncertainty about their true size.

> "[T]he estimators could be under considerable pressure for a favorable estimate and would have little professional backing for the particular choice they made. Even if the estimators did not succumb to such pressure, the credibility of budget estimates could be undermined if people who were not pleased with the estimate regarded the choice as arbitrary or politically motivated."[58]

According to this "cooking the books" argument, revenue estimators must be denied enhanced analytical capability lest they misuse it.

This argument is grossly misleading, however, because it conveniently overlooks the "cooking of the books" that occurs right now precisely because macroeconomic effects are officially ignored. The problem is that when substantial macroeconomic effects are present, an artificial estimation constraint that they be entered as zero guarantees that the resulting official revenue estimates will be slanted. In those cases, the biased estimates will report unrealistically large revenue losses from tax reductions and unrealistically large revenue gains from tax hikes. Indeed, it is this "cooking of the books" - to which proponents of the present constraint turn a blind eye - that those who wish to put macroeconomic feedbacks into revenue estimates are trying to end.

The argument is also misleading because, based on the rhetoric about how dangerous it is to give revenue estimators discretion, one would never guess that estimators already have considerable discretion to exercise their

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[58] CBO Paper, *op. cit.*, p. 12.

judgment in many areas. All but the crudest and most unsatisfactory revenue estimates necessarily involve a multitude of decisions by estimators. Estimators routinely make judgments with regard to many highly technical, but important details in their estimating models. They also estimate the partial equilibrium behavioral effects generated by tax changes. And at an earlier stage of the estimation process, judgments play an important role in shaping the macroeconomic forecast, which strongly affects the revenue baseline.

Supporters of the current rule are extraordinarily selective and arbitrary in objecting to discretion in one instance but not all the others. The same consideration that justifies giving estimators discretion in other areas also warrants allowing them to estimate macroeconomic behavioral effects: when an effect exists and is potentially substantial, excluding it from the analysis can seriously bias the results.

Admittedly, discretion can be exploited. The best defense against abuse is the professional integrity of the individuals actually performing the revenue estimates. A powerful further protection is to open the estimation models to outside scrutiny - something that is just now being implemented at the insistence of the present Congressional leadership - so that mistaken behavioral assumptions can be detected and criticized. Although publicity cannot protect against all dubious judgments, as the annual fights between the White House and the Congress over budget assumptions attest, estimators will be reluctant to go too far out on a limb if they know their work will be closely examined by outsiders.

Additionally, one should not exaggerate the discretion that would reside with individual estimators in predicting the macroeconomic effects of particular tax proposals. If macroeconomic effects are estimated in a systematic fashion by means of general equilibrium models and not on an *ad hoc* basis, the estimation models themselves will furnish considerable discipline. For example, with a revenue estimate on a particular bill, if the general equilibrium model being used predicts that the bill would have only a small macroeconomic effect, the staff member performing the estimate

would be hard pressed to claim that the macroeconomic effect would be large. Thus, some very good safeguards for protecting the integrity of estimators and their estimates are adopting general equilibrium models after careful and open review and limiting the ability of individual estimators to modify the models' parameters on their own volition when evaluating particular proposals.

Most tax legislation has no significant incentive effects on the overall economy; attributing cyclical, or Keynesian, macroeconomic effects would be extremely cumbersome and problematical. The CBO asks, "What types of macroeconomic consequences might be included in bill cost estimates?" Using the term "structural" for incentive-driven effects, the CBO dismisses them almost out of hand. In contrast to those who think incentives often elicit powerful reactions, the CBO claims, "Most of the legislation considered by Congress would not have significant structural economic effects."[59] The basis for this assertion is not clear. In 1993, for example, federal income tax rates on upper-income individuals and corporations were increased, raising the cost of working and saving and reducing the net return on corporate equity investment. In terms of revenue effects, these were major tax changes of the sort that have occurred frequently. Such structural effects surely cannot be dismissed as insignificant.

The CBO expresses no such doubts about the importance of Keynesian effects, which it calls cyclical effects. "Attributing a cyclical feedback to every bill would be...extremely cumbersome, because many bills - including those that otherwise affect only federal spending - would alter the government's fiscal stance and would in turn affect revenues."[60] It frets, however, about problems in modeling the interaction of different Keynesian effects, "Including cyclical feedbacks in budget estimates is more problematic than including structural feedbacks because cyclical feedbacks depend crucially on the behavior of the Federal Reserve. Calculating these

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[59] *Ibid.*, p. 11.

[60] *Ibid.*, p. 12.

feedbacks would thus require an assessment of how the Federal Reserve would be likely to react..."[61]

If the CBO's judgments were accepted, macroeconomic effects would not seem to belong in estimation models. In the CBO's view, incentive-driven macroeconomic effects should be excluded because they usually do not matter, and Keynesian effects, which supposedly do matter, are not practical to include in estimation models because their impact depends too heavily on what the Federal Reserve decides to do.

The CBO further claims that including incentive-driven macroeconomic effects and Keynesian effects in revenue estimates would be deceptive because the effects allegedly operate over very different time frames. Because of the supposed divergences between short- and long-run budget impacts, the CBO warns, "The macroeconomic effects occurring within the usual five-year estimating period might not accurately represent the proposal's long-term economic gains or losses."[62]

The CBO views macroeconomic incentive effects as usually being minor, but when they do matter, appearing mainly in the long run. In the CBO's words, "in the few cases in which structural economic changes [i.e., incentive-driven macroeconomic effects] might be expected, the changes are [more] likely to take some time to produce noticeable impacts ... [than to] begin quickly"[63] If this were true, most macroeconomic incentive effects would lie beyond the budget window. Hence, even if budget estimates began considering macroeconomic effects occurring within the budget window, they would continue to miss the bulk of macroeconomic incentive effects.

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[61] *Ibid.*, pp. 11-12. In Keynesian theory, fiscal and monetary actions can both alter aggregate demand. Thus, a tax change that moves aggregate demand in one direction can be countered by a monetary policy that has an opposite impact on aggregate demand.

[62] *Ibid.*, p. 3.

[63] *Ibid.*, p. 11.

The CBO believes Keynesian effects have the opposite problem. The CBO regards Keynesian effects as often being powerful in the short run but then dissipating and having little long-run influence. With this in mind, the CBO writes:

> "[S]ome analysts argue that cost estimates should include cyclical effects, such as the temporary economic stimulus from ... a tax cut that increased the deficit and left more money in the pockets of consumers or businesses. Others oppose including cyclical effects precisely because doing so would attribute short-term beneficial effects to increases in the deficit even though the long-run effects of the policy would be harmful."[64]

In essence, the CBO is cautioning that it would be unwise to include short-run Keynesian effects in budget estimates without taking account of long-term effects. The CBO is also intimating that the only way to prevent this from happening, given the current budget window, is to continue excluding macroeconomic incentive effects from budget estimates.

In assessing the importance of macroeconomic effects, however, the CBO has turned reality on its head. First, incentive-driven macroeconomic effects do matter and should be included in estimation models. Keynesian effects, on the other hand, should be excluded from the models because they derive from spurious first-order income effects on aggregate demand.

With regard to price, or incentive, effects, although the impact of incentives on overall economic activity was largely brushed aside when Keynesian economics reached its apogee in the 1950s, 1960s, and early 1970s, there has since been a growing recognition that incentives are extremely important.[65] For instance, many studies, some looking at the U.S.

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[64] *Ibid.*, p. 20.

[65] Lucas, *op. cit.*

economy and some looking at a cross-section of nations, have found that marginal tax rates exert a powerful influence on economic performance.

Neoclassical economic theory predicts and explains these findings. Aggregate income is the sum of the claims to output generated by production. Production is a function of the quantity of inputs and the effectiveness of their use. Fiscal policy changes alter explicit or implicit relative prices and costs (i.e., incentives). These first-order price, or incentive, effects impel individuals and companies to alter the uses of their incomes and to change the use of their production inputs. These adjustments in supply conditions, in turn, affect production and aggregate income. Thus, neoclassical theory explains that taxes and other fiscal policies have second-order income effects that result from business and household responses to tax-induced changes in incentives.[66]

Moreover, as explained earlier, people react rapidly to changes in prices and costs. Consequently, incentive-driven macroeconomic effects within the budget window are often very impressive. Thus, leaving macroeconomic incentive effects out of revenue estimates is not of little consequence; it seriously distorts the estimates.

Keynesian economics, on the other hand, has fared badly. Attempts to follow Keynesian policies have, in practice, yielded disappointments. At a theoretical level, Keynesian economics is gravely flawed. The Keynesian notion of how taxes affect the economy, for example, starts out by imagining that the government can readily adjust aggregate demand through tax and spending policies that alter disposable incomes. Keynesians believe aggregate demand then determines total output and employment.

A tax cut will supposedly increase aggregate demand because, with people surrendering less income to the government, they will have more to spend. Aggregate demand, however, appears to change only because the analysis is incomplete. Suppose the government lowers taxes in an effort to

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[66] For a more thorough explanation of the pathway through which taxes and other fiscal policies affect economic activity, see Ture, *op. cit.*

boost aggregate demand, leaving government spending unchanged. With tax collections reduced, the government will run a bigger deficit, and it will have to borrow more - just as much more as the revenue it forgoes by the tax cut. When the government borrows more, it will be taking away from private lenders the income it does not take away from taxpayers, and it will be reducing the income lenders have available to finance consumption or to invest in private capital formation. Because of this offset, a tax cut in isolation can't raise aggregate demand. Similarly, a tax increase in isolation can't lower aggregate demand.

Revenue estimators should continue to exclude Keynesian effects from their estimates. The reasons for this are defects and inconsistencies in Keynesian theory, not difficulties in anticipating Federal Reserve actions or disparities between short- and long-term Keynesian consequences. There should be no linkage in revenue estimates between incentive-driven macroeconomic effects and Keynesian effects.

Excluding macroeconomic feedbacks errs on the side of budgetary safety. Advocates of the continued exclusion of macroeconomic effects from revenue estimates often claim that the exclusion provides insurance against larger-than-expected budget deficits. Consider a proposed tax cut. If a revenue estimate ignores the tax cut's macroeconomic feedbacks, actual revenue collections will be at least as much as predicted, ignoring other possible sources of error in the estimate. If actual macroeconomic feedbacks are positive, the budget deficit will be smaller than predicted because revenues will be higher, again abstracting from other possible errors. Conversely, if an estimate includes positive macroeconomic feedbacks and they do not materialize, the actual deficit will be larger than predicted.

The CBO does not raise this issue, but the JCT does. It warns:

> "[M]ost of the discussion associated with proposals to take macroeconomic effects into account has focused on proposals which are viewed, at least by some, as having the potential for positive macroeconomic effects ... [T]o the extent that an estimate overstates

the positive macroeconomic effects of a proposed change, the result could be an increase in the deficit."[67]

This argument is one-sided, however; it breaks down with tax increases. When examining tax increases, the exclusion of macroeconomic feedbacks is not cautious but reckless. There, if one wants extra insurance with regard to budget deficits, macroeconomic feedbacks must be included. Because tax increases slow the economy by reducing its efficiency, they are a drag on federal revenues. Consequently, revenue estimates that neglect macroeconomic effects have a strong tendency to overestimate revenues from tax increases and underestimate budget deficits. Far from erring on the side of caution, then, revenue estimates that neglect macroeconomic feedbacks have a pro-deficit bias when considering tax increases. This bias, along with the rapid growth of government spending, helps explain why actual federal budget results are frequently disappointing compared to what had been estimated earlier.

Including macroeconomic feedbacks in revenue estimates would take too long and cost too much.

An alleged disadvantage of general equilibrium revenue estimates is that they are more difficult to perform than partial equilibrium estimates because they examine more economic interactions. Given that estimation models with macroeconomic feedbacks are more complicated than currently used models, the CBO states that, "Including macroeconomic effects in bill cost estimates would increase the amount of time and resources needed to prepare many of the estimates."[68] The CBO further asserts that the added time needed to produce revenue estimates with macroeconomic effects would be prohibitively great. The CBO, however, exaggerates the time and cost problems by assuming that relying on general equilibrium models would be

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[67] JCT Testimony, *op. cit.*, p. 21.

[68] CBO Paper, *op. cit.*, p. 13.

more time consuming and costly than the existing estimating methodology. In fact, the opposite is likely to be true.

The CBO is pessimistic in its assessment of the difficulty of performing revenue estimates with macroeconomic feedbacks. "Although some estimates would be straightforward and could be done quickly, others would be extremely complex and could not be done with the rapid turnaround that the Congress has come to expect... [S]ome delays ... might require stretching out the schedule for considering legislation - especially for lengthy and complicated legislation such as reconciliation bills and major tax proposals."[69] To emphasize that the time delays would be incompatible with Congress's usual style of doing business, the CBO warns, "The final versions of many of those bills are drafted in last-minute, late-night sessions just before a scheduled Congressional recess or the end of a session."[70] The CBO reinforces this image of a Congress tied in knots when it adds, "Unanticipated floor amendments could well affect the economic impact of legislation, and if they raised new issues, evaluating them might require days or weeks of research, analysis, and model simulation."[71] Given that Congress would not tolerate multi-week delays while awaiting revenue estimates, the CBO is declaring that revenue estimates with macroeconomic feedbacks are impractical.[72]

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[69] *Ibid.*, pp. 13-14.

[70] *Ibid.*, p. 14.

[71] *Ibid.*.

[72] Yet, even carefully done partial equilibrium analyses can be very time consuming, especially if they involve sweeping legislation. The CBO observes that its analysis of the Clintons' health plan "took several months" and "more than 40 staff members". (*Ibid.*, p. 14.) Strangely, the CBO cites this very time-consuming analysis done *under the current methodology* as supposed evidence that estimates with macroeconomic feedbacks are not feasible. (The CBO notes that its estimates of the plan's budget effects abstracted from macroeconomic effects. Although the CBO did examine some macroeconomic effects, it performed the budget estimates without them. See *Ibid.*, p. 6.)

The CBO, though, is overstating the difficulties. The key step in producing revenue estimates that allow for macroeconomic feedbacks is to develop a general equilibrium model or set of models that estimators can use. This is a major undertaking, but it is not uncharted territory. Economists have produced many general equilibrium models, admittedly with wide differences in their comprehensiveness and the economic theories on which they are based. If the CBO had developed a general equilibrium system and conducted tests of its ability to perform revenue estimates, its protestations that macroeconomic feedbacks could not be estimated in a timely fashion might be more credible. As it is, one must ask how the CBO knows a general equilibrium system would be impractical in estimating revenues when it has not tried using one for that purpose.

The CBO's bleak assessment is traceable in large part to a failure to envision the development of general equilibrium models that would greatly shorten the time needed to evaluate the macroeconomic effects in tax proposals. Instead, the CBO seems to imagine estimators struggling with assorted rules of thumb that probably are not integrated with each other and often would not cover relevant macroeconomic feedback channels.

> "In practice, the estimators would have to simplify their task by creating rules of thumb that would encompass some of the most important effects, rather than trying to run exhaustive simulations of the structural effects of each proposal. The rules of thumb would be based on results from empirical studies and would be regularly checked against model simulations... [H]owever, developing rules of thumb to cover many situations might not be possible."[73]

Although it certainly would be nice if general equilibrium models were simpler than the current methodology, the added complexity is not necessarily a disqualifying criticism. In deciding whether general equilibrium models are worth a further increase in complexity, what must be asked is how much is gained by using general equilibrium models and how great is the added complexity. By way of illustration, if easing the task of

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[73] *Ibid.*, p. 18.

revenue estimators were all that mattered, estimation models would be purely static, excluding all behavioral responses, and they would rely on ballpark guesses as to the number of taxpayers potentially affected by the tax provisions being examined. Studying tax return and other statistical data in order to estimate the number of taxpayers who might be affected by proposed tax changes is a major undertaking. So is attempting to estimate even own-market behavioral responses. Nevertheless, although back-of-envelope calculations sometimes offer insights, there is general agreement that the superior predictive ability of the partial equilibrium models now being used by revenue estimators justifies their additional complexity. Advancing from partial to general equilibrium analysis would be well worth whatever increase in complexity it might entail.

Consider in this light a fairly realistic example of a situation to which the CBO alluded. Suppose the House Ways and Means Committee sends to the floor a revenue bill with 12 provisions in it. The JCT will have performed a revenue estimate on the bill, and the JCT insists that to the extent possible the estimate will take account of own-market behavioral effects and of purely mechanical interactions between the bill and other taxes (and presumably also purely mechanical interactions among the bill's provisions). Now suppose an amendment is proposed on the House floor that would remove two major provisions from the bill, significantly altering it. Under current rules the JCT must provide a revised estimate, and the JCT claims that the revised estimate will again take account of own-market effects and of purely mechanical interactions among taxes. Furnishing lawmakers with this series of estimates places a heavy load on the JCT. It is not evident, however, that performing the estimates with a general equilibrium system, which is capable of properly accounting for macroeconomic feedbacks, would require substantially more work of the JCT - provided the JCT has an appropriate general equilibrium model at its disposal. Indeed, assuming the model has been correctly specified and its equations and parameters accurately estimated, the time required to obtain the revised estimates is almost certain to be far less than under the existing methodology.

A fact of life is that Congress sometimes demands very speedy revenue estimates. When time pressure is severe, an estimator may respond by taking shortcuts in the analysis, often attaching a note that certain issues could not be explored because there was just too little time. Rather than assuming that a general equilibrium model would halt Congressional business, the CBO and the JCT should carefully and objectively examine the time and cost savings that the availability of such a model would afford.

If macroeconomic effects are included in tax bill estimates, they must also be included in spending bill estimates. As usually presented, this argument is that if macroeconomic effects are important enough to include in revenue estimates for tax bills, they are also important enough to include in estimates of the net budgetary effects of spending bills. This line of reasoning does have merit because many spending programs have significant effects on the aggregate economy. Surprisingly, the CBO study does not mention this issue. It puts forward another consideration, claiming that including macroeconomic effects in revenue bill estimates but not spending bill estimates "would raise serious problems of consistency... Similar proposals could receive different estimates...if one was included in the tax code and the other involved a cash outlay."[74]

If the macroeconomic effects of spending changes are taken into account by estimators, it is crucial that the spending effects be correctly identified. Advocates of government spending programs sometimes claim the programs would yield such large gains to the overall economy that the programs would practically pay for themselves. The programs' defenders may declare that the programs would create thousands of new jobs and revitalize communities. Supporters also cite the Keynesian notion that government spending stimulates the economy: supposedly, government spending puts money in the pockets of consumers, and when consumers spend the money, production and employment allegedly rise to keep pace with the extra consumption.

In reality, though, every government program imposes costs on the economy, and those costs need to be subtracted from the benefits afforded by

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[74] *Ibid..*

the program in order to determine whether the program is beneficial or injurious to the economy's operation. Government spending programs involving purchases of goods and services preempt resources from private use or control. That preemption raises the cost of those resources for private use. Thus, a hidden cost of government spending is the forgone private-sector uses of the resources the government commandeers. That concealed cost needs to be subtracted from programs' benefits in assessing whether the programs would help or hurt the economy. Unfortunately, policymakers often concentrate on programs' benefits while rarely identifying or considering the opportunity costs.[75]

Consider a government construction program. In order to obtain production inputs for its program, the government must take the inputs away from private sector uses or direct them into channels different from those that the private sector would dictate. Thus, it is mistaken to look at the jobs and output associated with the government construction program and conclude that those jobs imply a rise in total employment and output. The net gain - or loss - to the economy is not the benefits flowing from the government's uses of the production inputs but the benefits from the government's uses minus the forgone benefits that would have been produced by the displaced private-sector uses of the inputs. (The latter is the opportunity cost of the government's project.) If the government's uses of production inputs are more productive than the forgone private sector uses, the economy will be strengthened; otherwise, the economy will be weakened. Some government uses may be extremely productive and generate positive macroeconomic effects. Very often, however, as a result of politics and other inefficiencies inherent in government decision making, government uses are much less efficient than the private sector uses they displace, and in all those cases the macroeconomic effects are negative.

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[75] As an analogy at the household level, if a family decides to finance an expensive new automobile by cutting back on its recreational and cultural activities, the net benefit is not the car's services but the car's services minus the opportunity cost (i.e., the value of the forgone activities).

As for government transfer programs, they often generate incentives inimical to work and saving. Consider a proposal to increase unemployment compensation payments. Because the higher payments would reduce the cost to the beneficiaries of being jobless, it would encourage them to be more selective in accepting jobs The spending increase, therefore, would depress employment and, with fewer people working than otherwise, also depress output. Both of these impacts would hurt tax collections. Further, the higher government payments, by giving people a "rainy day" cushion that they would otherwise need to provide themselves through private saving, would encourage people to save less and, correspondingly, consume more. That shift away from saving would lower investment, and the drop in investment would have a negative effect on tax collections, especially over time, because investment is a prime engine for economic growth.

But wouldn't the higher disposable incomes of beneficiaries help the economy by giving it a shot in the arm, with the stimulus perhaps magnified by the Keynesian multiplier effect? The defect in this scenario, is that, as explained earlier, unemployment compensation payments do not themselves increase income in the economy. In order to give funds to spending-program recipients, the government takes the funds away from taxpayers via taxes and from private lenders through deficit financing. Whatever other merits this program may have, it does not strengthen the aggregate economy. On the contrary, by interfering with normal work and saving incentives, it diminishes overall economic activity. The revenue feedback from that will be decreased tax collections.

In short, if the usual dollar-outlay estimates for government spending programs are augmented with estimates of macroeconomic effects, a few government spending programs would appear less expensive than they do now, some would show little change, and many would be revealed to be more expensive, often much more expensive, than they now appear. Taking account of macroeconomic effects of spending bills is conceptually sound <u>if</u> the effects are analyzed correctly. Improperly carried out cost estimates, on the other hand, are almost certain to be extremely deceptive.

The CBO suggests that bringing macroeconomic effects into cost estimates for spending bills may not be practical because, the CBO claims, it would force estimators to consider a vast array of possible reactions that might be difficult to predict. If this claim is correct and if one also accepts the CBO's assertion that macroeconomic effects should not enter tax-bill estimates unless they similarly enter spending-bill estimates, the implication is that macroeconomic effects should not be included in either spending-bill or tax-bill estimates.

As an example, the CBO presents a scenario in which a federal spending bill reduces grants to state and local governments and those governments then respond by boosting their own taxes to compensate for the lost federal funds.[76] If this occurred, the higher state and local taxes would have two negative effects on federal revenues. First, because individuals and businesses can claim many state and local taxes as federal tax deductions, the higher state and local taxes would reduce the federal tax base, causing federal tax collections to fall. Second, the higher state and local taxes would probably have a negative effect on overall economic activity, and that would depress federal tax collections. By convention, current spending-bill estimates exclude induced changes in state and local taxes.

The CBO is right that this chain of events is not inconceivable. But is the CBO justified in demanding that estimators predict such effects before they can include macroeconomic effects in their spending-bill estimates? Estimators might be reluctant to deal with the effect in the CBO's illustrative case for a variety of reasons. The responses of state and local governments to a federal spending change might be too unpredictable to estimate. The impact on federal taxes of state and local reactions might depend on the exact structure of the new state and local taxes, which will rarely be known when the estimate is performed. Or federal estimators might be reluctant to interject their conjectures about state and local government policies into federal budget decisions.

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[76] *Ibid.*, pp. 14-15.

Ironically, the CBO itself answers the question. In preparing a cost estimate on spending legislation, the CBO does not, in practice, attempt to estimate all conceivable effects within the categories of effects it considers but only those "effects of a proposal that can be estimated with sufficient confidence and precision..."[77] For instance, it often happens that several factors about which the CBO has very little information affect eligibility for a spending program. Although eligibility is extremely important in predicting a program's cost, the lack of information about some factors affecting eligibility typically does not prevent the CBO from producing a cost estimate. (If it did, very few cost estimates would be completed.) Instead, the CBO prepares the estimate, omitting the factors about which it has insufficient information. Similarly, the CBO says it includes own-market behavioral effects in its cost estimates, but it does not claim to include every imaginable own-market effect. The CBO's position is that own-market responses that are very uncertain or believed to be trivial ought to be excluded and that excluding them does not call into question the inclusion of other own-market effects that are more predictable or more important. If the CBO just applies to macroeconomic effects the same standard that it applies to other types of effects, it will take macroeconomic effects into account when possible and not exclude all macroeconomic effects because it is impractical to estimate some of them.

The CBO's attempt to link the treatment of macroeconomic effects in tax-bill and spending-bill estimates also raises a more fundamental question. Although it might be desirable to include macroeconomic effects in spending-bill estimates, should macroeconomic effects be ignored in tax-bill estimates if they are not brought into spending-bill estimates? The CBO's position, in essence, is that two wrongs make a right. That position only makes good economic sense, though, if the errors caused by ignoring macroeconomic effects in tax-bill estimates cancel out the errors caused by ignoring them in spending-bill estimates.[78] There is no evidence, however,

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[77] *Ibid.*, p. 5.

[78] The economic theory of the second best holds that sometimes piecemeal improvements are not desirable if existing problems tend to cancel out each other.

that the errors are mutually offsetting. Accordingly, it might be best to correct all errors at once, but if that is not possible, it is better to make a start and correct some errors than to correct none at all. Thus, the CBO's position that macroeconomic effects must be considered on an all-or-nothing basis is not backed by economic analysis or rudimentary logic.

Estimators need legislative authorization before examining macroeconomic feedbacks. The CBO contends that consideration of macroeconomic effects is blocked by legal and institutional barriers in Congress. The CBO further asserts that because of these alleged barriers, estimators should not include macroeconomic effects in estimates for either tax or spending bills unless new congressional legislation directs the estimators to go forward and tells them exactly how to proceed.

> "To make the budget process consistent with the new estimating approach, the Congress would have to change the Congressional Budget Act and the Balanced Budget Act to reflect the interrelated effects of tax and spending proposals."[79]

This argument begins with the CBO's insistence, discussed above, that macroeconomic feedbacks cannot be included in revenue estimates unless a myriad of other interactions are simultaneously brought into the estimating process. According to the CBO, tax-bill estimates would have to include not only estimates of revenue feedbacks but also estimates of possible feedbacks on mandatory and discretionary spending programs, and spending-bill estimates would need to include estimates of possible feedbacks both on other spending programs and on revenues: "If macroeconomic effects were included in cost estimates, bills that altered spending programs could also change revenues, and *vice versa*, and the budget process would have to recognize that fact."[80]

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[79] *Ibid.*, p. 3.

[80] *Ibid.*, p. 14.

Regrettably, continues the CBO, trying to expand estimates in this manner runs into a legal roadblock. The CBO argues that with the greatly expanded estimates many of the feedbacks would involve tax or spending programs lying outside the jurisdiction of the committee in which the bill was being considered. That overlap, the CBO maintains, is incompatible with current budget rules. At present, congressional committees have budget targets that relate to programs under their jurisdiction. Current budget rules do not allow one committee to meet its target by proposing legislative changes in programs lying outside its jurisdiction. If expanded revenue and spending bill estimates were implemented, the CBO warns:

> "The Congress would have to develop procedures for assigning both spending and revenue targets to committees or for allowing committees to substitute increases in revenues for reductions in discretionary or mandatory spending. The current system does not allow committees to offset revenues against spending."[81]

This argument breaks down on closer examination, however. It certainly is the case that one committee cannot meet its budget target by telling another committee what legislation to pass. For instance, a spending committee could not satisfy its budget target by approving a large spending increase and asking the revenue committee to pass a tax hike as an offset. However, what the CBO asserts would cause a problem is something completely different. According to the CBO, a piece of legislation lying within a committee's jurisdiction would suddenly violate jurisdictional boundaries if estimators examined the full range of its feedbacks.

That is a very shaky legal argument. The fact that committees may not invade each other's jurisdictions does not suggest that government estimators violate any rules by informing committees about the budgetary consequences of their proposed initiatives.

Moreover, if the CBO's argument were correct, many estimates would violate the law already when they consider purely mechanical and partial

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[81] *Ibid.*, p. 15.

equilibrium interactions among various spending programs or among spending programs and taxes. Contrary to the CBO's strained legal interpretation, estimators do not require new legislative authority in order to begin estimating macroeconomic incentive effects any more than they need new legislative authority in order to continue doing estimates under current procedures. The CBO itself cites an applicable example. In estimating the cost of changing the social security earnings test, which is officially classified on the spending side, estimators include the expected impact on "income and payroll tax collections."[82] If the CBO's legal analysis were correct, this mixing of cost and revenue feedbacks would be blatantly illegal. In fact, though, it is perfectly legal and also accords with Congress's committee structure.

Further, contrary to the CBO's claim that "the current system does not allow committees to offset revenues against spending," some committees now and in full compliance with the law do precisely that. The budget rules explicitly allow offsets between revenue and entitlement legislation, a fact that the CBO touches on earlier in its study but seems to have forgotten by the time it launches into its legal analysis.[83]

Even if the CBO's dubious legal argument were given the benefit of the doubt, a very wide range of important feedbacks could still be considered without crossing jurisdictional lines. The House Ways and Means Committee and the Senate Finance Committee have jurisdiction in their respective chambers over all revenue legislation and also over much entitlement legislation. Entitlements are a very significant category of federal

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[82] *Ibid.*, p. 7.

[83] The CBO states, "[U]nder PAYGO, changes in legislation affecting revenues and mandatory spending, in total, may not increase the deficit in any year." (*Ibid.*, p. 1.) This means, for example, that a tax change can lose revenue without triggering a point of order under the PAYGO rules if it is paired with an offsetting legislative change that increases revenue <u>or</u> that lowers entitlement spending.

spending, now comprising over half of the total. Because entitlements are open ended, they are more sensitive to changes in aggregate economic activity than fixed-dollar-amount discretionary spending. Given present committee jurisdictions, estimators could certainly include macroeconomic revenue feedbacks in tax-bill estimates without crossing committee lines. They could also examine how entitlement legislation would affect the overall economy and, in turn, feed back on entitlement spending, again without crossing committee lines. In addition, once again staying entirely within committee lines, estimators could include in tax-bill estimates both macroeconomic revenue feedbacks and macroeconomic entitlement spending feedbacks. Likewise, they could include in spending-bill estimates both macroeconomic entitlement spending feedbacks and macroeconomic revenue feedbacks.

The JCT staff could attach explanatory notes to revenue estimates instead of including formal estimates of macroeconomic revenue feedbacks. Although the JCT professes to be "always interested in exploring ways to improve the accuracy of ... revenue estimates," it maintains that revenue estimates should continue to exclude macroeconomic effects.[84] "There are difficult practical and theoretical hurdles to overcome prior to including macroeconomic effects in Joint Committee staff revenue estimates..."[85] As a substitute, the JCT recommends appending to estimates discussions of various relevant issues.

> "Much of the confusion surrounding revenue estimates could be alleviated through increased disclosure of the underlying assumptions ... used in deriving these estimates... [Also] the Joint Committee staff could provide additional information to the Congress as to the methodology that it has employed in preparing a revenue estimate, with particular emphasis placed on the types of taxpayer behavioral responses assumed in preparing the estimate. Further, the Joint

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[84] JCT Testimony, *op. cit.*, p. 22.

[85] *Ibid.*, p. 21.

Committee staff could provide information as to the likely effects a proposal might be expected to have on the economy."[86]

This proposed alternative is wholly inadequate. Revenue estimates are numbers. Adopting the JCT's proposal would derail efforts to improve the quality of those numbers.

Numbers carry great weight in Washington (often too much given the uncertainties and approximations associated with their derivation.) Appending various explanatory and cautionary observations to revenue estimates would not appreciably reduce the reliance that policymakers place on those numerical estimates. It would gain little to point out that revenue estimates have problems but then stop there without trying to correct the problems. Revenue estimates will continue to mislead policymakers and result in undesirable tax policies if the estimates themselves, that is, the numbers are not improved.

In a similar vein, the CBO comments, "The economic impact of policies can be shown by means other than cost [and revenue] estimating - for instance, committee hearings and reports, and analyses by Congressional staffs and others."[87] The CBO admits, though that this approach by itself would be of limited usefulness. "Such reports, however, sometimes carry less weight in the political debate than CBO's or JCT's estimates of a proposal."[88] The CBO also frets that supplementary analyses, if detailed, would be time consuming to prepare, possibly delaying the legislative process.[89]

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[86] *Ibid.*.

[87] CBO Paper, *op. cit.*, p. 5.

[88] *Ibid.*.

[89] According to the CBO, "The legislative schedule would have to allow sufficient time for such analyses." (*Ibid.*, p. 17.)

What Should Be Done?

Basic analytical principles in formulating a realistic revenue estimating system

If they are to be realistic and reasonably accurate, estimates of the net budget effects of fiscal changes must take account of how such changes affect the economy as a whole. The aggregate economic effects of a tax or government spending change reflect how individuals and businesses respond to that change, and how their responses affect aggregate production and the total income generated by production. These changes in production and income, in turn, necessarily affect the size of the bases of the various taxes in the federal revenue system, hence the tax revenues generated by these various taxes. To produce realistic and meaningful revenue estimates calls for an analytical system that identifies how individuals and businesses respond to fiscal changes, explains and measures how these responses lead to changes in such economic aggregates as GDP, total employment, wage rates, personal and corporate income, and other economic aggregates, and measures how these changes in economic aggregates alter tax bases and tax revenues.

Providing such information requires the use of a neoclassical, dynamic, general equilibrium analysis. The distinctive attribute of this system applied to measuring the budget consequences of fiscal changes is that it treats the initial impact of fiscal measures as changing one or more relative prices and/or costs, instead of initially or directly changing income. Public policymakers, it must be acknowledged, are not accustomed to thinking of spending changes or, with few exceptions, tax changes in these terms. Nonetheless, all fiscal policies may be readily described in terms of their initial effects on relative prices.

This is most easily illustrated in the case of taxes. Every tax alters the cost or price of the thing or activity that is taxed relative to other things. Virtually everyone recognizes this in the case of selective excise taxes which raise the explicit price of the taxed product or service relative to other prices.

An excise tax on cigarettes is universally perceived as increasing their price compared to the prices of other things. This price or cost effect, however, is not confined to selective excises. Every tax has an excise effect, i.e., raises the implicit if not explicit price of the thing or activity that is taxed compared to other things.

An income tax of the basic configuration as the existing federal income tax, for example, raises the implicit cost of producing income that is defined as taxable in the tax laws compared with the cost of producing valuable returns that are not so defined. Earning wages and salaries by supplying a given amount of one's time as an employee costs the employee the forgone value of other, so-called *leisure* uses of that time. Imposing an income or payroll tax on wages and salaries means the employee must earn more of such income to have as much left after taxes as before the tax was imposed. The imposition of the taxes, however, does not reduce the value of the leisure uses of one's time and resources. The taxes make it more costly, in terms of the forgone value of leisure, for the employee to obtain the same after-tax income as before the taxes were levied. Clearly, the higher the rate of the income or payroll tax applied to the marginal dollar of wage or salary, the greater is the tax-induced increase in the opportunity cost of working.

Income taxes have very much the same excise effect on the cost of saving compared with the cost of using income for current consumption. Saving and consumption uses of income, obviously, exhaust the current income available to a person. The cost of saving - of using current income to acquire assets that will produce additional income in the future - is the value of the current consumption that is necessarily forgone. Under the income tax, income that is saved, with some exceptions, is included in current taxable income, just as is income used for current consumption. The income produced by the assets acquired with current saving, however, is also taxed, while income used for current consumption, though often subject to sales taxes, is not usually subject to additional income taxation. Income taxation of both the income that is saved and the income that saving produces increases the opportunity cost of saving, i.e., increases the amount of current consumption that must be

forgone to obtain a given amount of after-tax future income, compared to that cost in the absence of the income tax. [90]

While every tax affects one or more relative prices, no tax has any initial or direct effect on income. This proposition confronts the intuitively appealing notion that changes in one's tax liability leaves one with more or less income to use for consumption and saving. While this may be true for one or more individuals, it can't be true for the economy as a whole.

To see this, consider, say, an income tax reduction with no change in government spending. In the Keynesian analysis, this results immediately in an increase in disposable income, which in turn must result in an increase in current consumption, saving, or both. This creates an increase in demand for output, leading businesses to expand their demands for production inputs, and resulting in increases in employment, in investment, and in total output.

Appealing as this scenario long has been, it is invalidated by the fact that since the tax reduction, by itself, was not accompanied by a cut in federal spending, each dollar of revenue loss must result in an equal increase in the budget deficit. Someone must buy the debt instruments the government issues to finance this deficit, and in doing so, the buyers reduce by the same amount as their debt purchases the income they have available for current consumption or investment in private capital. In other words, although some people may use their additional disposable income to increase their current consumption and/or investment, others must reduce their total private spending to purchase the additional government debt instruments. Some redistribution of spending almost certainly will result, but no increase in total spending, in real terms, can occur.

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[90] For a simple arithmetic illustration of these excise effects of income taxes, see Norman B. Ture, "The Economic Effects of Tax Changes: A Neoclassical Analysis," Volume 4 in *Stagflation: The Causes, Effects, And Solutions, Special Study On Economic Change*, Joint Economic Committee, Joint Committee Print, December 17, 1980, pp. 323-328.

In broader terms, a tax reduction unmatched by a government spending cut results initially in a decrease in gross national saving. Since gross national saving is definitionally and necessarily equal to gross investment, the tax cut could at most increase consumption spending at the expense of reduced investment. The tax cut might change the composition of spending, but it won't change the aggregate amount.

By the same token, a tax increase with no change in government spending does not have any direct effect on aggregate income, although it may well change the distribution of spending among the population as well as the composition of output.

More fundamentally, a tax change cannot directly alter the economy's aggregate income, because it does not directly increase the amount or the productivity of production inputs. Income consists of the payments made to suppliers of production inputs; these payments are the claims to output that are generated by production activity. Without a change in production, there isn't - can't be - a change in real income. But changes in production and output can occur only as changes in the amount of production inputs and the effectiveness of their use occur. If it is to result in a change in income, a tax change must induce a change in the supply of production inputs. To do so, the tax change must change the opportunity costs of supplying those inputs.

In other words, the effect of tax changes on aggregate income depends on the initial effects of the tax change on the cost of working relative to that of leisure and on the cost of saving relative to the cost of current consumption uses of current income. An effective revenue estimating system must embody this perception of the initial impacts of a fiscal change.

The neoclassical analysis does not exclude income as a determinant of economic behavior. Indeed, changes in income are deemed to be extremely powerful influences on how people conduct their economic lives. One of the central issues of fiscal policy addressed by neoclassical economics is how income growth trends are affected by the structure of the tax system and by

the level and composition of government spending. As urged in the preceding discussion, the appropriate analysis must begin by identifying the initial or direct effects of fiscal actions on relative costs and prices. The next step is to describe and measure how people in the private sector respond to these cost and price changes at the initial income levels. These responses determine the changes in the level and composition of total output, hence total income. These changes in income, in turn, enter into decisions about working, saving and investing, leading to further changes in output and income.

The important corollary of recognizing that all taxes affect relative prices and costs is that people's responses to these cost and price effects will necessarily lead to changes in aggregate output and income and therefore to changes in the bases of the taxes comprising the federal tax system. The magnitude of the tax base changes will vary not only with respect to the magnitude of the cost and price effects but also with respect to the responsiveness of taxpayers to these effects, i.e., the elasticity of their responses to the cost and price changes. One of the major tasks in designing a model that realistically describes and measures the economic effects of fiscal changes is to identify and to estimate the factors that determine those elasticities. These responses must not be ignored, as they very largely are in the existing revenue estimating methodology, on the assumption that they are necessarily inconsequential in the budget time frame.

Attributes of the revenue estimating model

As this discussion urges, to analyze and measure how the economy responds to fiscal changes and how these responses affect federal tax revenues, the revenue estimating model's simulations must be initiated by the relative price effects of the fiscal changes. For this purpose, the model's equations that describe household and business behavior must include as explanatory variables the various relative prices that may be affected by fiscal actions.

As noted in the preceding discussion, every tax alters the cost and price relationships that would otherwise result from the market's operations. The way in which people respond to tax-induced price and cost changes is the starting point in analyzing and measuring the economic effects of taxation.

For example, the desired amount of saving, at any given income level, must be specified as a function of its expected after-tax rate of return on the marginal dollar of saving. The model's equation that delineates saving behavior should also include a number of demographic, cultural, and other influences. Most of these change only slowly, and are effectively represented as constants in the specification. The amount of saving people want to undertake may also be delineated in terms of additions (or decreases) in the stock of capital people want to hold. These adjustments in the desired stock of capital depend on the net-of-tax cost of the future income provided by a marginal dollar of capital relative to the cost of current consumption, as well as on the existing stock of capital, i.e., wealth, and the constants listed above.

The neoclassical, dynamic general equilibrium model specifies the conditions for equilibrium in markets both for production inputs and outputs. Economy-wide production is specified in a production function that shows the relationship between basic production inputs - land, labor, and capital - and aggregate real output.[91] Conditions of supply of such inputs must be specified as functions of the *net-of-tax* returns for the marginal unit of the input relative to the explicit or implicit marginal returns for the alternative uses of each. In the case of capital, as already suggested, the alternative to providing a marginal unit of capital input by saving is current consumption; whether it pays to forgo the required amount of current consumption to acquire that marginal unit of capital depends on the net-of-tax return one expects it to provide. For labor, the alternative use is so-called leisure - the use of one's time, energy, talents, and other resources for

[91] Sub-models specifying production relationships for particular products and services may also be developed and integrated with the economy-wide model in a second level of effort to reform existing revenue-estimating methodology.

rewarding non-market-directed activities. One of the principal alternative uses for land is leaving it out of current production and seeking its reward in the form of an increase in its potential market value.

The demand for a production input, expressed in traditional neoclassical terms, is the schedule of its marginal value products at differing amounts of its use. Marginal value product is the increase in the total value of production attributable to the use of the marginal unit of the production input, holding constant the quantities of other inputs. The marginal value product of each input is derived from technical production relationships. Tax or other fiscal changes, therefore, have no first-order or direct effect on an input's marginal value product.

Market equilibrium with respect to each input's use is denoted by equality of its marginal value product to its marginal factor cost - the change in the total cost of the input's use resulting from the use of the marginal unit. Necessarily implied thereby is that in equilibrium, the after-tax, risk-adjusted, real (inflation adjusted) marginal return will be the same for every type of capital input in every use; similarly, the net-of-tax real return for each type of labor services in every use will be the same.

The existing income tax provisions provide highly differentiated treatment of differing kinds of capital in differing uses. Changes in the tax law, accordingly, often differentially pertain to one or more types of capital or capital uses. To assure that the estimating model appropriately measures the change in the aggregate stock of capital that satisfies the market equilibrium conditions, a subset of equations with respect to each of the principal types of capital, differentiated on the basis of their tax treatment, is called for.

The adjustment period in the case of physical capital is likely to be relatively short. Some empirical research indicates that a very substantial

fraction of the change in the stock of capital in response to tax changes is accomplished in five years.[92]

The market equilibrium conditions in the case of labor are not achieved in short periods of time. Differing types of labor services are differentially rewarded primarily on the basis of the amount and quality of the human capital with which they are invested. In many cases, that human capital is not readily replicated or transferable. This means that for extended periods of time, significant wage and salary differentials will prevail. This does not mean that tax and fiscal changes will have no effect on labor supply conditions. It implies, instead that the short-run, econometrically-estimated elasticity of supply of the total labor force with respect to its net-of-tax real returns is likely to be small.

In contrast with the highly differentiated tax treatment of different kinds of capital, the income tax treatment of labor compensation differs little among differing kinds and uses of labor services. It is feasible, therefore, to model labor as a homogeneous input.[93]

The explanatory power of the neoclassical model could be enhanced were it feasible to develop a subset of equations for differing groups of labor inputs, based on relevant differences among them. Determining the

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[92] Robbins and Robbins, "Looking Back to Move Forward: What Tax Policy Costs Americans and the Economy," *op. cit.*

[93] In truth, however, there are significant differences among differing types of labor, as suggested above, and substantially uniform tax treatment may elicit significantly different responses among these different groups of suppliers of labor inputs. To a large extent, these differing responses result from differing degrees of specialization of the labor services; as a general rule, the more highly specialized is the labor service, the larger is the share of its compensation in excess of its opportunity cost - the returns it could obtain in its best alternative use. To the extent that it falls on this excess compensation, the tax is likely to elicit a relatively small change in the amount of the labor service supplied in its current use; to the extent the tax bears on the opportunity cost element in the labor input's compensation, on the other hand, it is likely to have a much more substantial effect.

differences in specialization and in the share of opportunity costs in compensation as the basis for grouping labor inputs, however, is a daunting conceptual and empirical undertaking. Until this problem can be resolved, the specification in the model of labor as a homogeneous input appears to be unavoidable, but unlikely to distort the model's outputs to a significant degree.

Conditions of demand for final products and services are derived in market-wide terms - consumption and saving - although sub-market specifications for particular products and services to be integrated with the aggregate economy model are conceptually feasible. At this stage these sub-models should be regarded as of secondary importance.

The neoclassical formulation treats business entities as agencies of their individual owners. Businesses are not in competition with households for capital formation as opposed to current consumption uses of available resources, output, and the income claims therein. Similarly, business decisions about the disposition of after-tax earnings, whether retained and reinvested or distributed to shareholders, are made in conformity with the preferences of the individuals who own the businesses. In the same vein, business decisions about the financing of operations and growth, subject to the constraints of tax and regulatory provisions, are made to minimize the costs that must ultimately be borne by owners. There is, accordingly, no occasion for specification of a separate set of equations describing business behavior as such. Indeed, such specification would be redundant and lead to misleading conclusions.

In application, tax changes are identified in terms of changes in marginal tax rates applicable to the income claims generated by the provision and use of production inputs. In turn, these changes in marginal rates are measured as changes in the relative prices of the directly affected behavior or activity. A decrease (increase) in individual income tax rates, for example, reduces (increases) the cost of working relative to leisure and of saving relative to consumption uses of current income.

A liberalizing change in the tax treatment of capital recovery in the business income tax, as another example, is identified as decreasing the marginal tax rate on the gross returns for capital use, increasing temporarily the net-of-tax, risk-adjusted real return on the marginal unit of the stock of capital. This leads in the very short term to more intensive use of existing capital facilities, and in the longer term to larger additions to the stock of production facilities than would otherwise occur. As these adjustments occur, capital inputs relative to other inputs increase, resulting in a decrease in the marginal value product - often identified as "service price" - of capital, hence in a decrease in the after-tax return to capital; this adjustment process will continue until people wish to make no further additions to the stock of capital. Barring any changes in the fundamental determinants of saving behavior, the adjustment process ends when the increased stock of capital has pushed the after-tax, risk-adjusted, real return on capital back to what it was before the tax reduction.

The increase in the amount of capital relative to labor inputs increases the productivity of labor, hence the demand for labor services. The consequence is an increase in employment and real wage rates. Along with the larger stock of capital, these adjustments produce increases in total output and in the income claims generated thereby, in turn increasing most, if not all, tax bases in the federal revenue system. The consequence is an increase in tax revenues from most, if not all revenue sources, offsetting part of, and in some cases more than, the revenue loss estimated under the existing, static methodology that assumes no changes in aggregate output and income and that precludes accounting for the changes in economic aggregates that necessarily occur if markets operate at all efficiently.

Now consider how the neoclassical formulation would deal with payroll taxes. Changes in payroll taxes are represented as changes in the marginal rate of income tax on labor returns, changing the cost of working relative to leisure, hence changing the amount of labor services that will be offered at any given market rate of compensation. In this treatment, the full amount of the payroll tax, including the employer's share, is assigned to the worker, conforming with the consensus prevailing among economists. The change in the conditions of supply of labor services clearly affects the costs of

business use of such services, resulting in changes in employment and in market wage rates. By the same token, the changes in labor inputs will lead to changes in the marginal value product of capital, inducing changes in the optimum stock of capital. These changes combine to change the level of output and of the income generated thereby.

Changes in excise taxes are shown as changes in the marginal income tax rates on the inputs contributing to the production of the taxed products or services. The popular view is that producers and sellers of products subject to excise taxes "pass the tax forward" by raising the prices of the products by the amount of the tax. They may well attempt to do so, but since nothing about the tax increases the incomes of the product's purchasers or the demand for the product, the unit volume of its sales must fall as its price is raised. This must, in turn, lead to a decrease in its output, hence in the amount of the production inputs used in its production and in the inputs' aggregate compensation. This ultimate effect is closely approximated by treating the change in the excise tax as a change in the marginal income tax rate applicable to the suppliers of the production inputs.

These marginal tax rate changes affect the conditions of supply of the affected inputs. In the case of an excise increase, the amount of labor and of capital services that will be offered at any given wage or service price will decrease and the market prices for the inputs will increase. Less of these inputs will be used as production of the taxed product or service is cut back in response to the increase in input costs.

With no initial change in the basic conditions of demand for the taxed product or service, its market price will rise to the point at which the quantity demanded and the quantity supplied are the same. In this new market-clearing situation, each production input's pre-tax return will equal its new marginal value product and its after-tax return will be the amount the supplier of the input requires to offer that amount of the input.[94]

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[94] The existing methodology's partial equilibrium treatment of excise changes can be readily revised to fit into the neoclassical analytical approach.

The overall general equilibrium conditions described above mean that these revisions in the market for the excise-taxed products or service are only a first step. The initial changes in input use and in input returns must lead to changes in the conditions of supply in other markets, as well. This is fairly obvious in the case of producers of raw materials, energy supplies, and other products and services used in the production of the excise-taxed items. The cutback in the production of those items in response to the excise increase necessarily leads to a cutback by their producers of their purchases from their suppliers. The higher prices of the items also leads to a reduction in output by the purchasers for whom the taxed items are production inputs. The higher prices also induce retail purchasers to substitute other products whose relative prices are decreased by the excise. The excise tax, in short, must affect both the composition and levels of total output and income, even if only to a small extent.

Perhaps less obvious is that the economy-wide equilibrium conditions toward which the adjustments in response to fiscal changes move require equalization of the after-tax, risk-adjusted, real returns for labor, capital, and land inputs, respectively, in all of their uses. This necessarily means that unless market processes collapse, the responses to fiscal changes cannot be confined to the individuals and businesses immediately affected. Whether large or small, near or long term, fiscal changes must affect economic aggregates, hence tax bases and the revenues they generate.

Changes in transfer - estate and gift - taxes are identified as changes in the marginal rate of income tax on income that is saved, discounted to the present from the time at which liability for these taxes is expected to be incurred. For young people, the perception of the weight of these taxes and changes therein may well be dimmed by their remoteness in time and that may limit their effect in choices about the saving-consumption uses of current income. This weight must certainly increase as people age. The treatment of these taxes in the neoclassical model is very much the same as that of income taxes on the cost of saving relative to consumption uses of current income.

Every tax in the federal revenue system alters the cost and price relationships that would otherwise result from the operations of the market

system. To assume that people as household and business decision makers are unresponsive to the tax-induced changes in relative prices and costs is to deny logic, rigorous analysis, observable experience, and common sense.

Recognizing that people do, indeed, respond, that these responses are reflected in market operations, and that these operations tend toward market equilibrium requires recognition that economic aggregates are affected by tax provisions and changes therein. Moreover, it must be recognized that these changes in economic conditions alter the bases of the taxes comprising the federal tax system. Any effort to estimate the revenue effects of existing tax provisions or of changes therein must necessarily attempt to determine how these tax bases are affected by changes in economic aggregates resulting from people's responses to tax provisions and tax changes. The neoclassical, dynamic, general equilibrium analysis and the kind of model it calls for would afford far more realistic estimates of the revenue consequences of tax legislation than the official methodology now in use.

Conclusion

The importance of meaningful revenue estimates for good budget and economic policies calls for major changes in the revenue estimating methodologies now in use by the executive and legislative branches of the federal government. These estimating methods, by deliberately excluding the overall economic consequences of tax changes, misrepresent the effects of those changes on federal tax revenues. The consequence, obviously, is that expected net budget results are misstated, inducing policymakers to make decisions about budget policy that may well differ from those they would make if better information were available to them. Similarly, their policy decisions are not fully and accurately informed by the economic effects of tax changes.

If new and better approaches to budget policy making are to be pursued, improving the methodology and analytical foundations for revenue estimating, indeed, for spending estimation, as well, are important elements in the required processes. Most of the objections to revising the existing methodology are either mistaken or of little substance or both. This study, it is hoped, will contribute to an objective assessment of the deficiencies in the existing methods and of the improvements that can and should be made therein.

Note: Nothing here is to be construed as necessarily reflecting the views of **IRET** or the ***Savers & Investors Foundation*** or as an attempt to aid or hinder the passage of any bill before the Congress.

About This Report And IRET

Objective economic analyses of the impact of government tax policies on the functioning of a free-market economy are essential for constructive public economic policies. Equally important are sound prescriptions of the kinds of policy changes that will reduce existing government obstacles to private saving and capital formation and to productive private efforts.

This report, by **IRET** Senior Economist Michael A. Schuyler and **IRET** President Norman B. Ture, examines key deficiencies in federal procedures for estimating how tax changes affect government revenue. Failings in current procedures, notably the insistence that tax changes do not affect the overall economy, systematically mislead policy makers, resulting in tax policies that may cost the American public hundreds of billions of dollars yearly. Correcting the deficiencies in the current estimating methodology is practical. And it is urgent.

Founded in 1977, **IRET** is a nonpartisan public policy research organization dedicated to aiding the formulation of policies that will strengthen our nation's free market economic system, thereby fostering economic growth and prosperity. In pursuit of this mission, **IRET** provides public policy leaders, business leaders, the media, and interested citizens with concise, rigorous, and objective analyses of the economic effects of current and proposed tax, spending, and regulatory policies.

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