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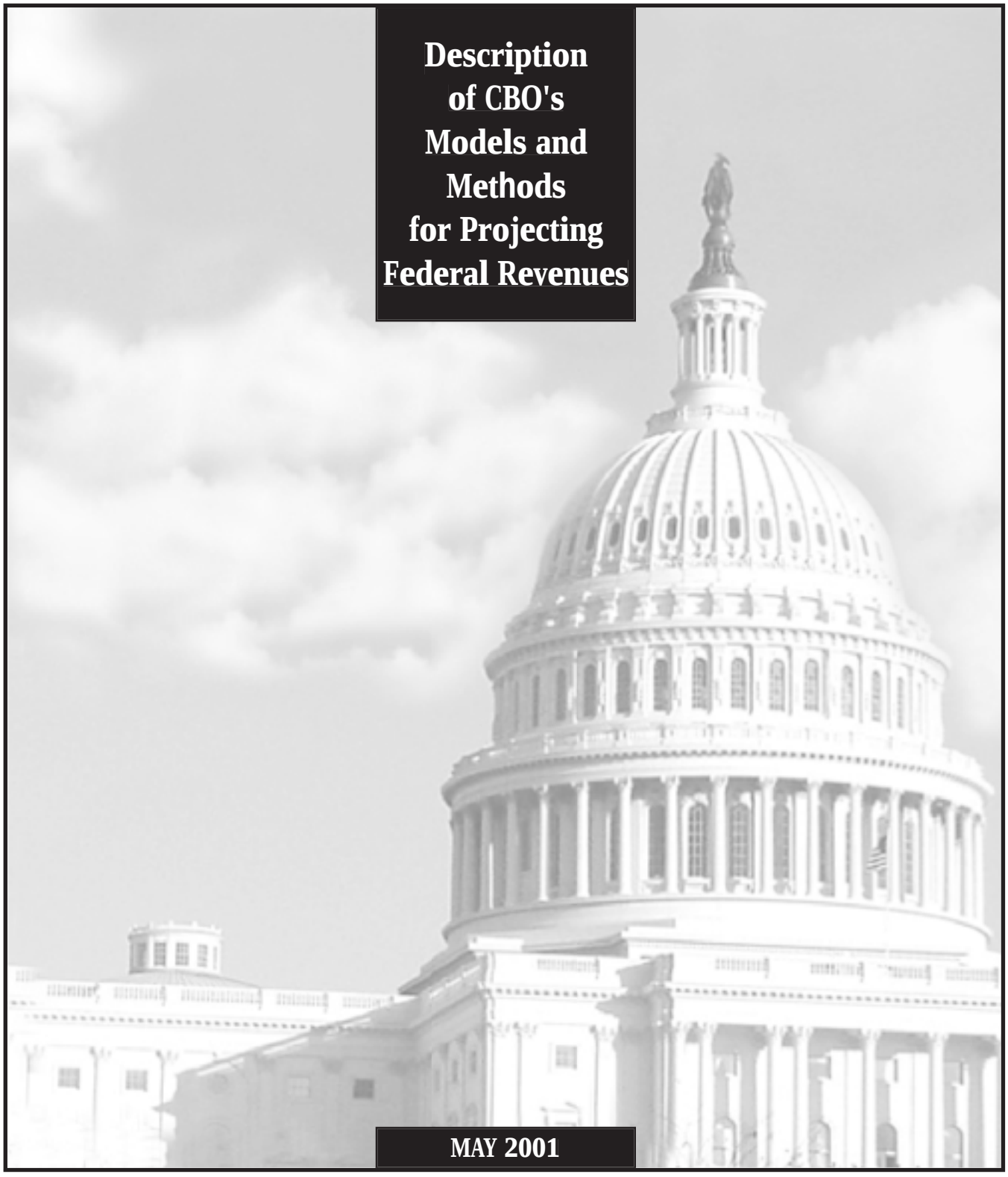
A
CBO
PAPER

Description of CBO's Models and Methods for Projecting Federal Revenues



MAY 2001

NOTES

Unless otherwise indicated, the years referred to in this paper are fiscal years.

Numbers in the text and tables may not add up to totals because of rounding.

Description of CBO's Models and Methods for Projecting Federal Revenues

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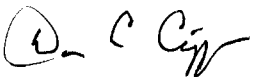
PREFACE

This Congressional Budget Office (CBO) paper describes the various methods that CBO uses to produce the 10-year projections of federal revenues that form part of its budget baseline. The paper discusses the models and methods used to project different types of revenues, such as those from individual and corporate income taxes, social insurance taxes, and excise taxes.

Mark Booth of CBO's Tax Analysis Division wrote the paper under the direction of Thomas Woodward. Arlene Holen, Preston Miller, John Sturrock, David Weiner, and Roberton Williams of CBO provided helpful comments.

Christian Spoor edited the manuscript, and Leah Mazade proofread it. Simone Thomas prepared the paper for publication, and Annette Kalicki prepared the electronic versions for CBO's Web site (www.cbo.gov).



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May 2001

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INTRODUCTION

The Congressional Budget and Impoundment Control Act of 1974 requires the Congressional Budget Office (CBO) to issue detailed budget projections in an annual report to the Congress. That report, which is usually published in the winter and updated each summer, contains projections of federal outlays and revenues for the current year and the next 10 years. Those budget projections provide the Congress with a baseline against which to measure the effects of proposed changes in tax and spending laws.

By design, CBO's budget projections are not intended to forecast actual future spending and revenues. In order to serve as a baseline against which to measure proposed changes, the projections need to reflect what would happen over the next 10 years under current tax and spending policies. As a result, the revenue portion of the baseline generally assumes that current tax laws remain in place and scheduled changes occur on time. Even provisions of the tax code that are routinely extended are generally assumed to expire as scheduled.

This paper describes the models and other techniques that CBO uses to project revenues for its baseline, including how the agency's macroeconomic projections and other key inputs are incorporated in the forecasting process.

REVENUES IN THE BUDGET BASELINE

Federal revenues come from taxes imposed on individual and corporate income, business payrolls, production and importation of specific goods, and transfers of estates and gifts. In addition, receipts are derived from a number of miscellaneous sources, including the operations of the Federal Reserve System, fees imposed on various activities, and fines.

Individual income taxes generate approximately half of the federal government's total revenues (see Table 1). Social insurance payroll taxes (principally for Social Security and Medicare) account for almost one-third. Corporate income taxes are responsible for roughly one-tenth of federal revenues. The remainder (7 percent to 8 percent) comes from other sources—with excise taxes, Federal Reserve receipts, estate and gift taxes, and customs duties being the most important contributors (in that order).

For most of the past 40 years, federal revenues have fluctuated between 17 percent and 19 percent of gross domestic product (GDP), a relatively narrow range (see Figure 1). That relative constancy, however, does not reflect an inherently stable relationship between taxes and GDP. (Since 1995, for instance, receipts have increased from 18.3 percent of GDP to 20.6 percent, a level exceeded only during

TABLE 1. FEDERAL REVENUES, BY SOURCE, IN SELECTED FISCAL YEARS

	1980	1985	1990	1995	2000
In Billions of Dollars					
Individual Income Taxes	244	335	467	590	1,004
Corporate Income Taxes	65	61	94	157	207
Social Insurance Taxes					
Old Age, Survivors, and Disability Insurance[a]	113	186	282	351	481
Hospital Insurance	23	45	69	96	136
Unemployment Insurance	15	26	22	29	28
Other	6	8	8	8	9
Subtotal	158	265	380	484	653
Excise Taxes	24	36	35	57	69
Estate and Gift Taxes	6	6	12	15	29
Customs Duties	7	12	17	19	20
Miscellaneous Receipts					
Federal Reserve receipts	12	17	24	23	32
Other	1	2	4	5	10
Subtotal	13	19	28	29	43
Total Revenues	517	734	1,032	1,352	2,025
As a Percentage of Total Revenues					
Individual Income Taxes	47.2	45.6	45.2	43.7	49.6
Corporate Income Taxes	12.5	8.4	9.1	11.6	10.2
Social Insurance Taxes					
Old Age, Survivors, and Disability Insurance[a]	21.9	25.4	27.3	26.0	23.7
Hospital Insurance	4.5	6.1	6.6	7.1	6.7
Unemployment Insurance	3.0	3.5	2.1	2.1	1.4
Other	1.2	1.1	0.8	0.6	0.4
Subtotal	30.5	36.1	36.8	35.8	32.2
Excise Taxes	4.7	4.9	3.4	4.3	3.4
Estate and Gift Taxes	1.2	0.9	1.1	1.1	1.4
Customs Duties	1.4	1.6	1.6	1.4	1.0
Miscellaneous Receipts					
Federal Reserve receipts	2.3	2.3	2.4	1.7	1.6
Other	0.2	0.2	0.4	0.4	0.5
Subtotal	2.5	2.5	2.7	2.1	2.1
Total Revenues	100.0	100.0	100.0	100.0	100.0

(Continued)

TABLE 1. CONTINUED

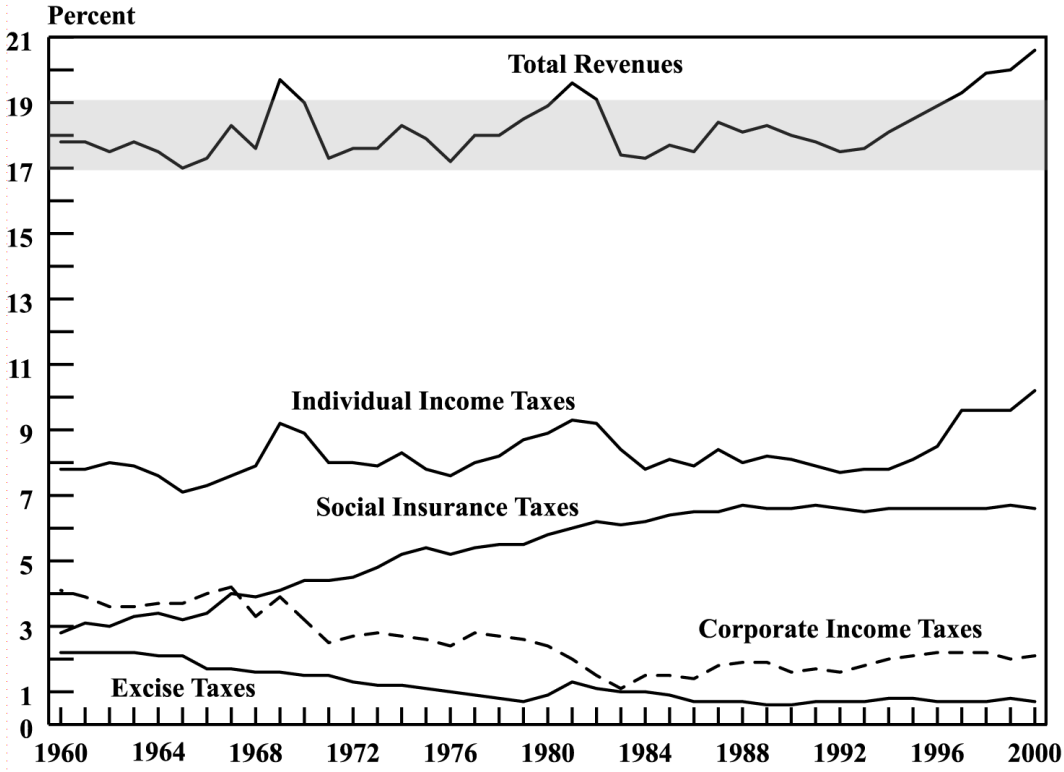
	1980	1985	1990	1995	2000
As a Percentage of GDP					
Individual Income Taxes	8.9	8.1	8.1	8.1	10.2
Corporate Income Taxes	2.4	1.5	1.6	2.1	2.1
Social Insurance Taxes					
Old-Age, Survivors, and Disability Insurance[a]	4.1	4.5	4.9	4.8	4.9
Hospital Insurance	0.8	1.1	1.2	1.3	1.4
Unemployment Insurance	0.6	0.6	0.4	0.4	0.3
Other	0.2	0.2	0.1	0.1	0.1
Subtotal	5.8	6.4	6.6	6.6	6.6
Excise Taxes	0.9	0.9	0.6	0.8	0.7
Estate and Gift Taxes	0.2	0.2	0.2	0.2	0.3
Customs Duties	0.3	0.3	0.3	0.3	0.2
Miscellaneous Receipts					
Federal Reserve receipts	0.4	0.4	0.4	0.3	0.3
Other	*	*	0.1	0.1	0.1
Subtotal	0.5	0.4	0.5	0.4	0.4
Total Revenues	18.9	17.7	18.0	18.5	20.6

SOURCE: Congressional Budget Office.

NOTE: * = less than 0.05 percent.

a. Off-budget.

FIGURE 1. FEDERAL REVENUES, BY SOURCE, AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT, 1960-2000 (By fiscal year)



SOURCE: Congressional Budget Office.

World War II.) Various factors can cause taxes to vary as a proportion of GDP. For example, many excise taxes are imposed as specific dollar amounts per unit of selected products, so they tend to fall as a percentage of GDP as prices rise. In contrast, individual income taxes, because of their progressive structure, tend to rise relative to GDP (as total income grows, more is taxed at higher statutory rates).[1] In addition, parts of the tax base, such as capital gains realizations and the value of estates, are not directly linked to GDP and therefore may vary largely independent of it.

The main reason for the relative stability of total tax revenues as a percentage of GDP has been the actions of policymakers. On many occasions in the past, when revenues have risen sharply, tax cuts have been enacted in response, and when revenues have lagged, tax increases have been enacted. Without those policy responses, revenues as a percentage of GDP would have varied a great deal more than they actually did.

1. A tax is considered progressive when the ratio of tax payments to income increases as income rises.

CBO's baseline projections assume no policy changes. Consequently, the methodology for projecting revenues involves a great deal more than using the past relationship of receipts to GDP as a guide and determining that revenues change by a given percentage for every percentage change in macroeconomic activity.

Instead, it is necessary to identify the macroeconomic variables that constitute the bases on which federal taxes are imposed and apply the appropriate tax rates to those bases to determine the receipts that the projected level of macroeconomic activity will yield. CBO therefore models each tax source separately and projects total revenues by summing the projections of the separate sources. Because taxes interact, CBO incorporates the major known connections between the sources.

Regardless of the particular variant used for each source, the basic method is largely the same for all sources. A macroeconomic projection provides information about what will happen to the tax *bases* (or if not the actual bases, something from which the tax bases can be derived). Revenue projections result from applying the appropriate tax *rates* to those bases. "Appropriate" rates in this case can be either statutory tax rates (those set by law) or "effective" tax rates (calculated as the percentage of the tax base that, after all of the various adjustments are taken into account, is actually owed and collected in taxes). Much of the method described below—despite the various complexities involved—boils down to deriving effective tax rates to apply to the tax bases that come out of CBO's macroeconomic projection.

THE MACROECONOMIC PROJECTION

All baseline revenue projections begin with a projection of the economy. Revenues depend critically on economic performance. As incomes, payrolls, corporate profits, imports, consumption of goods, and wealth increase, so do the receipts from income and payroll taxes, customs duties, excise taxes, and estate and gift taxes. At the same time, the performance of the economy depends on revenues. The pattern of revenues relative to outlays affects demand in the short run and the capacity to produce in the long run. As a result, total economic activity and revenues are determined jointly. Although CBO's macroeconomic and revenue models are not automatically linked in a simultaneous system, they are produced in a way that generates consistent macroeconomic and revenue projections.

CBO first develops a preliminary macroeconomic projection. In doing so, it considers a wide range of factors: recent data on the state of the economy, historical relationships between economic variables, the results of formal econometric models, the projections of other forecasters, and the opinions of CBO's Panel of Economic

Advisers and other experts.[2] The preliminary macroeconomic projection incorporates certain proxy measures—such as estimated marginal tax rates on different sources of income—that closely approximate the effects of the projection on revenues. Once the preliminary macroeconomic projection is generated, CBO runs its tax models with inputs from that projection to produce more refined estimates of revenues. CBO then incorporates the resulting revenue projections into a subsequent macroeconomic projection through changes to the federal fiscal sector of the macroeconomic model. That process of substitution and revision is repeated until the macroeconomic projection of revenues and the tax-model projection of revenues converge.

Since income and payroll taxes account for about 90 percent of federal revenues, CBO's revenue baseline depends most heavily on its macroeconomic projections of wages and other personal income and of corporate profits. (The key macroeconomic inputs to CBO's revenue models are summarized in Box 1.) Most of the macroeconomic measures use definitions from the official national income and product accounts (NIPAs), but the tax bases correspond to measures defined by tax law. CBO takes the differences in those measures into account when generating projections of revenues.

INDIVIDUAL INCOME TAXES

Although the individual income tax has many complexities, its basic structure is straightforward. Taxpayers add up their income from various sources (net of exclusions), subtract standard or itemized deductions and personal exemptions to determine taxable income, apply the schedule of graduated tax rates to determine their tax liability (how much they owe), and subtract various credits to determine their final tax liability. One of the complexities is the existence of the alternative minimum tax (AMT), a parallel system of individual income taxation with its own set of income types, exclusions, exemptions, and tax rates. For example, in tax year 2000, the top statutory rate for the regular income tax was 39.6 percent; for the AMT, it was 28 percent. Taxpayers in effect pay the greater of the taxes calculated under the two systems. Although only about 1 percent of taxpayers now pay tax under the AMT, CBO projects that under current law, that share will rise to roughly 15 percent in the next 10 years. That increase is projected to occur principally because the two systems treat differently the effects of changes in income caused by inflation.

CBO uses a microsimulation approach to project liabilities from individual income taxes and then uses historical patterns of payment to project how those liabilities will be paid over time as receipts (see Box 2 for an overview of that

2. For more details about CBO's macroeconomic modeling, see Congressional Budget Office, *Description of Economic Models*, CBO Memorandum (November 1998). For a list of the members of CBO's Panel of Economic Advisers, see www.cbo.gov/panel.shtml.

BOX 1.
KEY INPUTS TO CBO'S BASELINE REVENUE MODELS
FROM ITS MACROECONOMIC PROJECTION

Individual Income Taxes
Wage and salary disbursements (from the national income and product accounts)[1]
Monetary personal interest income (from the NIPAs)
Personal dividend income (from the NIPAs)
Proprietors' income (from the NIPAs)
Rental income (from the NIPAs)
Consumer price index for all urban consumers (from the Bureau of Labor Statistics)
Gross domestic product (from the NIPAs)[2]
Employment (from the Bureau of Labor Statistics)

Corporate Income Taxes
Before-tax profits (from the NIPAs)
Rest-of-world profits (from the NIPAs)

Social Insurance Taxes
Wage and salary disbursements (from the NIPAs)
Proprietors' income (from the NIPAs)
Employment (from the Bureau of Labor Statistics)
Unemployment rate (from the Bureau of Labor Statistics)

Excise Taxes
Motor fuels model:
- Relative fuel prices (from the NIPAs)
- Real GDP (from the NIPAs)

Other excise models:
- Real GDP (from the NIPAs)
- GDP (from the NIPAs)

Estate and Gift Taxes
GDP (from the NIPAs)

Customs Duties
Nonoil imports (from the Census Bureau)

Federal Reserve Earnings
Interest rates on Treasury securities (from the Board of Governors of the Federal Reserve System)
Currency (from the Federal Reserve Board)
Total reserves (from the Federal Reserve Board)
Trade-weighted exchange rate (from the Congressional Budget Office)

All of the income variables except real GDP are in current dollars.

1. The national income and product accounts (NIPAs) are estimated by the Commerce Department's Bureau of Economic Analysis.

2. GDP is used to project future capital gains realizations. (CBO uses other macroeconomic measures to project capital gains realizations for the most recently completed year.)

BOX 2.
CBO'S METHOD FOR PROJECTING INDIVIDUAL INCOME TAXES

Step 1
Begin with a sample of 1998 tax returns.

"Age" the sample to match
- projected demographic changes (such as in population and employment),
- projected incomes based on the Congressional Budget Office's (CBO's) macroeconomic projections (such as for wages, interest, and dividends), outlay projections (for program benefits), and other projections (such as for capital gains and retirement income).

Result: the projected tax base for 1999 through 2011.

Step 2
Apply the tax calculator, incorporating
- tax-law parameters,
- CBO's macroeconomic projection of the consumer price index.

Result: projected tax liabilities on individual income tax returns for 1999 through 2011.

Step 3
Adjust projected tax liabilities for consistency with actual collections of owed taxes in 1998 through 2000.

Result: projected collections liabilities for 2001 through 2011.

Step 4
Convert projected collections liabilities into fiscal year payments by
- breaking down liabilities by type of payment,
- applying recent experience in the timing of payments,
- adjusting for recent legislation not incorporated in step 2, and
- adding fiduciary taxes and back taxes.

Result: projected tax payments for fiscal years 2001 through 2011.

method). The microsimulation approach uses a sample of tax returns that represents the diversity of households in the U.S. economy. It applies a projection of different types of taxable income and adjustments to income based on comparable measures from the macroeconomic projection. It then calculates how much those households will owe in taxes on those incomes. Finally, it converts those calendar year tax liabilities into expected payments by fiscal year.

Projecting the Tax Base

In projecting the base for the individual income tax, CBO must keep track of which types of income go to which types of taxpayer. That is, it must estimate what share

of total wages and salaries, rent, interest, dividends, or proprietors' income goes to taxpayers who file returns singly, jointly, or as a head of household, broken down by age, sex, and income.

Determining that distribution is necessary for several reasons. First, the tax system is progressive, so growth in revenues depends on the degree to which growth in total income comes from an increase in the number of tax returns or from an increase in income per return. If growth in total income occurs more because of increases in income per taxpayer than because of increases in the number of taxpayers, then more of the additional income will be earned by taxpayers who face higher tax rates. Second, different household characteristics, such as age and number of children, affect tax liability, so demographic changes influence income tax receipts. Third, various features of the tax code imply that different effective tax rates apply to different sources of income. Thus, as the different sources of income change relative to each other, they must be accounted for explicitly to produce a reliable projection of tax liability.

CBO employs its microsimulation model to allow for those factors. The model uses a database of individuals' income tax returns compiled annually by the Statistics of Income (SOI) Division of the Internal Revenue Service (IRS). The most recent database contains a sample of more than 120,000 tax returns for tax year 1998. The data include all of the basic information from those returns for that year.

The underlying assumption is that many of the basic characteristics of filers in the most recently available tax year will persist through the immediate future. But the number of taxpayers and relative importance of various subgroups of taxpayers will change over that time, as will the kinds of income they receive. Hence, to simulate conditions in a projection year using the database of tax returns from a past year, CBO must adjust ("age") the database to reflect projected changes in the number of returns and in the amount of income and deductions for each return. That aging is accomplished by changing the weights in the sample—the total number of returns that each sample return represents—and the incomes on the returns.

Adjusting for Demographics. In its first step to age the database, CBO uses population projections from the Social Security Administration to adjust for changes each year in the projected number of tax returns from each subgroup of filers. Those projections are detailed by age, sex, and marital status. Using the projections, CBO changes the sample weights in its model to reflect the expected growth in the number of single, married, and head-of-household filers between the sample year and the projection year. This step also uses employment figures from CBO's macroeconomic projection to adjust the total number of returns filed each year.

The weight that applies to each subgroup generally changes as its relative share of the population changes. For example, compared with younger individuals,

older people tend to earn a greater share of their income from capital and less from labor. Also, between 2005 and 2011, the population age 50 or over is expected to increase much faster than the younger population. Thus, for demographic reasons alone, returns with a high share of capital income should grow more quickly over that period than returns with a high share of labor income.

Adjusting for Income Changes on Each Return. In its second step to age the database, CBO extrapolates the reported income and deductions on each return using different techniques. The extrapolation process first requires that each type of income or other item found on tax returns (other than those calculated by formula) be matched with a corresponding measure that CBO projects in the aggregate. Changes in that corresponding measure should track changes in the associated tax-return measure historically and be expected to track them during the projection period. The extrapolation process then involves calculating the increase in income necessary on each return, given the first step of demographic aging, so that in the aggregate, the amounts on tax returns grow at the same rate as the corresponding measures.

The macroeconomic projection, especially its variables from the national income and product accounts, provides the basis for extrapolating many tax-return measures. Those macroeconomic variables include wages and salaries, personal dividend income, and interest income (only the monetary portion, which excludes imputed interest). Each of those macroeconomic variables has a direct counterpart on tax returns. In addition, proprietors' income in the NIPAs corresponds roughly to the business income from sole proprietorships and partnerships shown on tax returns. None of the NIPA variables exactly match the corresponding tax-return measures because of differences in what they cover and how they are measured (see Box 3). Some are closer approximations than others. But in all cases, CBO chooses the specific NIPA variable because it tends over time to move with the corresponding tax-return measure.

A number of the components of return-based taxable income, such as benefits from the Social Security and unemployment insurance programs, have no direct counterpart in CBO's macroeconomic projection. Instead, those benefits are projected on the basis of CBO's spending projections for those federal programs. Other tax-return measures, such as realizations of capital gains and distributions from individual retirement accounts (IRAs), have no counterpart in CBO's macroeconomic or spending projections and must be estimated separately.

BOX 3.
NIPA AND SOI MEASURES OF INCOME

Deriving revenue projections from a macroeconomic projection requires translating measures of income used in the national income and product accounts (NIPAs) into measures reported on tax returns and compiled in the Internal Revenue Service's Statistics of Income (SOI) database. That conversion is necessary because the two sets of measures are intended to serve different purposes. The NIPAs are designed to characterize economic concepts of income, product, and expenditure flows. NIPA data are used in macroeconomic forecasting because they are readily available in the form needed and because they correspond to the underlying economic relationships on which macroeconomic models are built.

SOI measures of income correspond to tax law and deviate substantially from economic concepts in the NIPAs. Some forms of wage and salary compensation in the NIPAs, such as certain fringe benefits, are not taxed. Some types of NIPA income, such as the income added to retirement accounts, are tax-deferred from the time they accrue until a later date. By contrast, some types of income that are measured for tax purposes, such as most capital gains, are not part of current output and thus not part of income as defined by the NIPAs. In addition, definitions of corporate income differ between the two sets of measures. For example, some corporate expenses that are used in computing economic profits in the NIPAs are not deductible expenses in determining taxable profits. Moreover, the economy includes a number of entities, such as charitable organizations and cooperatives, that are not subject to taxation but whose income is included in the NIPA totals.

As the text explains in more detail, in many cases there are close NIPA analogs to the SOI measures, and the Congressional Budget Office (CBO) uses those analogs to project the SOI measures. The NIPA variables that CBO selects to approximate the SOI measures tend over time to move with their corresponding SOI measures. Those NIPA variables must also be part of CBO's macroeconomic projection. In some cases, no close NIPA analog exists, and CBO must model that component of taxable income separately.

CBO projects capital gains realizations using a two-stage process. The first stage projects realizations for the most recent year by modeling the annual growth rate of the ratio of gains realizations to potential GDP. That ratio is a function of several explanatory variables: tax rates on capital gains, the annual growth rate of stock prices or of the dollar volume of stocks, the annual growth rate of the ratio of GDP to potential GDP (to reflect the stage of the business cycle), and an indicator of the multifamily housing market.[3] The second stage of the process projects capital gains realizations beyond the most recent year by predicting that over the longer term, they will revert to their historical relationship with GDP, adjusted for the tax rate on gains.

CBO models taxable IRA withdrawals by combining data on IRA balances from the Survey of Consumer Finances (produced by the Board of Governors of the

3. See Preston Miller and Larry Ozanne, *Projecting Capital Gains Realizations*, Technical Paper 2000-5 (August 2000), available from CBO's Tax Analysis Division or at www.cbo.gov/tech.html.

Federal Reserve System) with data on IRA withdrawals and contributions from tax returns. The IRA model tracks withdrawal rates by the age of the taxpayer and applies them to projected balances. In that way, the projection of IRA withdrawals can capture the effects of various cohorts (segments of the population), which it would miss if overall population and growth factors were applied to withdrawals in the base year.

After matching each item on tax returns with a corresponding variable that it forecasts, CBO adjusts the income on each tax return. As described above, CBO ensures that growth in the income measures on tax returns, when weighted to generate aggregate measures, matches growth in the corresponding macroeconomic or other projected variables.

The following example illustrates the two steps in adjusting the sample of tax returns for growth in wages and salaries. In the CBO macroeconomic projection released in January 2001, the aggregate wage and salary income of individuals, as measured in the NIPAs, was projected to increase by 96 percent between calendar year 1998 (the base year of the tax-return sample) and 2011. With wages and salaries per tax return assumed to be fixed, the demographic changes incorporated into the model during the first step of the aging process produced a 13 percent increase in aggregate wage and salary income on tax returns. To achieve an aggregate growth rate in wages and salaries on tax returns of 96 percent, wages and salaries for each tax return in the sample had to increase by about 73 percent ($1.96 \div 1.13 = 1.73$) in the second step of the aging process. Thus, the number of returns with wage and salary income increased (step 1), as did the amount of wages and salaries earned per return (step 2).

CBO repeats that two-step method for the different types of income recorded on tax returns, using a corresponding macroeconomic or other measure that CBO projects through 2011 for the second step. Those other types of income include interest, dividends, proprietors' income, capital gains, and other sources that, together with wages, make up nearly all of the income reported on tax returns. However, for certain types of income on tax returns (which account for only about 1 percent of total income on tax returns), as well as for itemized deductions, CBO employs an alternative method in which the growth factor applied in the second step is the growth factor (measured at the second step) of the aggregate of wages, interest, dividends, and proprietors' income in the macroeconomic projection.

CBO generally assumes that any given type of income grows at the same rate for every taxpayer in the sample. That is, the distribution of a particular type of income among income groups does not change. The distribution of wages among income groups, for example, has typically been assumed to be the same in all of the projection years as in the sample year. If deemed appropriate, the individual income

tax model can be—and sometimes has been—adjusted further to project changes in the distribution of particular types of income.

Even so, in its unadjusted form, the model projects some change in the overall distribution of income. The reason is that different types of income tend to accrue to taxpayers in different income classes. Consequently, more rapid growth in some types of income than in others during the projection period affects the overall income distribution. For example, a projection for more rapid growth in dividends than in wages would alter the projected overall distribution of income.

Calculating Tax Liabilities

After the database has been aged to reflect the number of returns and the macroeconomic projection, CBO essentially calculates the amount of taxes that each filer would owe. For that purpose, CBO has created a tax "calculator" analogous to the popular computer software that helps people prepare their tax returns. The calculator takes certain primary variables from the tax returns in the sample (such as wages, dividends, and interest income) as given and combines them with certain parameters established by tax law (such as the definition of total taxable income or the schedule of tax rates) to construct the overall measures that taxpayers report: total income, total deductions, total taxable income, tax liabilities before credits, credits, and tax liabilities after credits. Measures that taxpayers calculate as sums or other mathematical functions of the primary variables on tax returns are determined the same way in CBO's tax calculator. Not surprisingly, the tax calculator replicates the amount of income, deductions, taxable income, and tax liabilities that virtually every taxpayer in the sample reported on his or her tax return.

Frequently, under tax law, certain provisions are scheduled to change during the projection period. Thus, CBO adjusts the parameters defined in tax law to match the law for each year (generally assumed to be the law as currently enacted, including scheduled changes) and then applies the tax calculator to project total taxable income, tax liabilities, and other measures for that year. Some of those parameters —such as the standard deduction, the value of personal exemptions, and the tax brackets—are indexed to the consumer price index. CBO therefore increases those parameters at the same rate that it projects for the consumer price index in its macroeconomic projection. Other parameters, such as the percentage of health insurance premiums that self-employed people may deduct, are scheduled to change over time under current law. Many others, such as the 7.5 percent floor on itemized deductions for medical expenses, are constant.

After adjusting for changes in tax law, the next step is simply to apply the values from each tax return to the parameters in the tax calculator. That must be done for each year from the year of the sample database through the projection

period—13 or 14 years in all. The amounts on returns are weighted to match amounts in the economy as a whole and then added up for each projection year.

Projecting Tax Receipts

To project federal receipts, CBO must deal with two further issues. First, liabilities calculated from extrapolating sample tax returns differ from the underlying liabilities implied by actual data on federal revenues for the past year or two (the years between the base year and the present). CBO must be able to estimate those underlying liabilities. Second, CBO's models project tax liabilities for calendar years, but the federal government uses fiscal years that run from October 1 to September 30. Because the beginning and ends of fiscal and calendar years differ, and because liabilities incurred differ from payments received, CBO must convert calendar year liabilities into fiscal year receipts. Moving from tax year liabilities to fiscal year payments, therefore, involves applying the appropriate timing rules for payments of tax liabilities stemming from different types of income.

During the course of a calendar year, taxpayers remit withholding and estimated taxes at more or less the same time that they incur those liabilities. Final tax payments and refunds, by contrast, are typically made in the following calendar year, when returns are filed. As a result, fiscal year receipts include nine months of withholding and estimated taxes from the concurrent calendar year, three months of withholding and estimated taxes from the previous calendar year, and final payments and refunds associated with liabilities incurred in the previous calendar year. In addition, final settlements from earlier years appear as payments and refunds throughout the fiscal year.

Calibrating Projected Liabilities to Collections-Based Liabilities. To determine the amount of tax liabilities implied by recent tax collections, CBO starts with data on the flow of income tax receipts published in the Treasury Department's *Monthly Treasury Statement*. That publication classifies receipts as withheld, nonwithheld (including both estimated and final payments), and refunds. Using Treasury tabulations that break down nonwithheld receipts into estimated and final payments and that identify the final payments and estimated payments associated with past tax years, CBO calculates "collections liability," a measure of tax liability implied by actual collections. Collections liability lacks the detail of tabulations from actual returns, but it is more current, giving a good indication of recent liabilities as much as a year ahead of data drawn from tax returns.

However, collections liability and liability projected by the microsimulation model from sample returns typically will not match for recent years. A discrepancy of 1 percent is not unusual. Various factors account for the mismatch.

- The most recent NIPA measures of wages and other types of income may contain inaccuracies that will be revised later when more complete data become available.

- Capital gains and other tax-return measures not projected with NIPA variables may have been different in the most recent year than CBO's estimates.

- Taxpayers' characteristics may have changed in ways not captured by the adjustments made to CBO's model.

- Assumptions in the model about taxable income, deductions, credits, and other components critical for determining tax liabilities may be wrong.

CBO attempts to reconcile those differences by assessing their potential causes and makes judgments about whether the differences are likely to persist, grow, or decline over time. In effect, CBO projects collections liabilities using the growth path from the microsimulation model's projection of return-based liabilities, modified by the assumed permanence of the recent difference between the two measures. For example, if collections liabilities for the most recently completed year are $10 billion higher than the model's projection of liabilities and that difference is not expected to persist in the projection period, CBO will project that collections liabilities will grow $10 billion more slowly than the return-based liabilities projected by the microsimulation model. It is that projection of collections liabilities that CBO uses in the next step.

Converting Calendar Year Liabilities into Fiscal Year Receipts. To project the payment of tax liabilities as receipts, CBO applies past timing patterns to collections liabilities. First, CBO divides projected collections liabilities into categories on the basis of how they will be paid: withheld, nonwithheld (both estimated and final), and refunds. That division is based on historical relationships.

CBO then applies historical timing factors to those categories of collections liabilities to convert liabilities into receipts. For example, withheld taxes tend to be paid relatively evenly over the year, so nearly three-quarters of those liabilities in a calendar year are assumed to be paid in the same fiscal year. Liabilities paid as final payments, by contrast, are all assumed to be paid in the subsequent fiscal year.

As the last step, CBO adjusts its projection of individual income tax receipts for certain factors not included in the microsimulation model's projection of liabilities. First, CBO adds the effects of recent legislation not incorporated in the model. Second, it adds projections of back taxes and fiduciary taxes, which are not

included in the SOI's sample of tax returns. (Fiduciaries pay taxes on the earnings of trusts and estates under the individual income tax.)

Simulation Properties of the Microsimulation Model

By experimenting with the microsimulation model, CBO has developed rules of thumb that allow it to quickly and easily approximate the effects on revenues of changes in economic activity. The rules of thumb can be summarized by two measures that translate changes in projections of NIPA income variables into changes in projections of tax revenues. The first measure is the marginal tax rate—that is, the rate at which an additional dollar of personal income is taxed. It varies by type of income as well as by whether the change in income results from inflation or from a change in real (inflation-adjusted) income. One type of income does not usually grow in isolation, however, and the marginal tax rate does not allow for interactions that occur when all types grow. To address those limitations, the second rule of thumb measures tax elasticity—that is, the percentage increase in individual income tax revenues from a 1 percent increase in all types of NIPA income and in all income-related deductions. The tax elasticity also depends on whether the change in income is caused by inflation.

Marginal Tax Rates. Various characteristics of the tax system cause different types of individual income to be effectively taxed at different marginal rates. Those differences are reflected in CBO's tax projections. Marginal rates can be estimated by simulating the effect of an incremental (say, 1 percent) change in a particular NIPA income variable on liabilities predicted by the microsimulation model (see Table 2, which also includes the effects of such a change on social insurance and corporate income taxes). The marginal rates calculated here apply for real changes to particular types of income. Marginal tax rates for income changes caused by inflation would be smaller because the tax brackets and certain other tax parameters would change with inflation.

The marginal tax rates on various types of income as measured in the NIPAs depend on the difference in magnitude between the NIPA measure and the corresponding tax-return measure and on the distribution of the corresponding tax-return measure among taxpayers. Differences between the two measures of income matter because additional increments of NIPA income are assumed to be allocated, in part, to nontaxable forms. Specifically, an extra dollar of any type of income is assumed to be allocated exactly as the average dollar is allocated. For example, much of people's monetary interest income, as measured in the NIPAs, is not subject to tax. Thus, adding a certain amount of income to that source would generate a much smaller increase in taxable income. As a result, although taxpayers would typically face a marginal tax rate of more than 20 percent on taxable interest income,

TABLE 2. MARGINAL TAX RATES ON DIFFERENT TYPES OF INCOME AS MEASURED IN THE NATIONAL INCOME AND PRODUCT ACCOUNTS
(By calendar year, in percent)

Type of NIPA Income	Estimated Marginal Tax Rates Under Current Law		
	2001	2006	2011
Wage and Salary Disbursements			
Personal income tax	24	25	26
FICA	12	12	12
Total	36	37	38
Proprietors' Income			
Personal income tax	7	8	8
SECA	5	5	5
Total	12	13	13
Personal Dividend Income[a]	9	9	9
Personal Interest Income[a]			
Monetary	10	10	10
Total (Including imputed)	4	4	4
Corporate Profits Before Tax[b]	30	30	30

SOURCE: Congressional Budget Office.

NOTES: These rates assume no changes in prices or employment.

FICA denotes payroll tax withholding on employees and employers; SECA denotes payroll taxes on self-employed workers.

a. Marginal tax rates for dividend and interest income apply to individual income taxes only.

b. Marginal tax rates for corporate profits mainly apply to corporate income taxes but also include effects on individual income taxes from taxable personal income from S corporations.

the marginal tax rate on such income as measured in the NIPAs—about 10 percent—is relatively low. By contrast, wage and salary disbursements in the NIPAs closely match taxable wages and salaries; thus, the marginal tax rate on NIPA wage and salary income is relatively high at about 25 percent. (The overall marginal tax rate on wages and salaries is boosted further by social insurance taxes.)

The distribution of income among taxpayers also matters because statutory tax rates tend to rise with income and some types of income are disproportionately earned by higher-income taxpayers. That factor, however, tends to cause less variation in marginal tax rates by type of income than do the differences between tax-return measures and their corresponding NIPA measures.

Tax Elasticity. The estimates of marginal tax rates do not capture interactions if income from more than one source changes. For example, increasing both the wages and interest income of all taxpayers by 1 percent would push a greater proportion of the additional income into higher tax brackets than if only one of those types of income had changed. Typically, such interactions are fairly small. But precise forecasting requires running the full model in cases in which more than one type of income changes. In those cases, CBO looks at the more comprehensive measure of tax elasticity (the percentage change in taxes resulting from a 1 percent change in all types of income and income-related deductions). It is a particularly useful measure for quickly estimating the revenue effects of a comprehensive change in projected incomes.

CBO estimates that the individual income tax elasticity for real income changes during the projection period is about 1.5. That result is generated by simulating increases in all types of income, itemized deductions, and adjustments to adjusted gross income of 1 percent annually starting in 2001, with no change in prices. Personal exemptions and standard deductions, which are indexed to prices, do not change. But itemized deductions, which tend to grow with the income of taxpayers, rise by 1 percent annually along with income. Total revenues from individual income taxes (including the AMT) increase by about 1.5 percent each year. That elasticity remains relatively stable for income changes several times larger than 1 percent.

The estimated tax elasticity exceeds 1 even when real incomes are constant in the face of rising prices. If taxpayers receive increases in income that just keep pace with increases in prices, the estimated tax elasticity will be about 1.05 in 2002, growing steadily to about 1.15 by 2011. Although those elasticities remain well below the ones associated with real income changes, they show that under reasonable macroeconomic assumptions, total income tax revenues will not only continue to grow more rapidly than income but will do so at a faster rate over time.

The effects of the AMT are the primary reason that inflationary increases in income cause total income tax revenues to increase by more than income. Because the tax brackets and exemption amount for the AMT are not indexed to inflation (in contrast to those of the regular tax), as higher prices push up nominal incomes, more taxpayers become subject to the alternative minimum tax. Measuring only the changes in regular tax revenues under current law, CBO estimates the tax elasticity for income changes due to higher prices at just about 1 after the first year of the simulation. For the first year alone, the elasticity is about 1.5, the same as that for real income changes, because increased prices do not affect the indexed tax parameters until the following year. The elasticities cited for specific years can differ when measured over time, because certain unindexed income thresholds become more important for larger income changes.

CORPORATE INCOME TAXES

As with the individual income tax, the basic structure of the corporate income tax is straightforward, but tax laws create many complexities. Basically, corporations operating in the United States must calculate their profits under rules set by law, and those profits in total make up the corporate tax base. Companies apply the statutory tax rates—which currently range from 15 percent to 35 percent—to that base to determine their tax liabilities and then subtract certain credits to arrive at their final tax liabilities. The corporate income tax does not apply to all businesses that are incorporated under state laws. In addition, many special rules govern corporate income generated in other countries. Moreover, losses play a much greater role in calculating corporate income than in calculating individual income, potentially offsetting a corporation's taxable income over years both before and after the current year.

The method CBO employs to project corporate income tax receipts is very different from the one it uses for individual income tax receipts, although there are some broad similarities (see Box 4 for an overview of that method). Like its model for individual income taxes, CBO's model for corporate taxes defines a tax base and generates an effective tax rate to apply to that base. It then uses historical payment patterns to estimate the payment of the projected liabilities as receipts. In the case of corporate taxes, however, CBO derives and works with the tax base and effective tax rate in aggregate form. Rather than using a microsimulation approach, CBO combines its projection of the tax base (corporate profits) with the statutory corporate tax rate to create a "first-cut" estimate of liabilities. An econometrically estimated equation that relates that measure and other variables to historical values for adjusted liabilities is then used to convert the first-cut measure into a projection of corporate liabilities before credits and the corporate AMT. Those latter items are projected separately and added in.

BOX 4.
CBO'S METHOD FOR PROJECTING CORPORATE INCOME TAXES

Step 1
Begin with the Congressional Budget Office's (CBO's) macroeconomic projection of profits before tax (as measured by the national income and product accounts).

Adjust that profits measure to approximate the tax base by
- removing profits of the Federal Reserve,
- removing state and local corporate taxes,
- removing rest-of-world corporate profits,
- removing profits of S corporations, and
- adding corporate capital gains.

Result: a proxy of the corporate tax base.

Step 2
Determine tax liabilities by
- applying statutory tax rates to the proxy tax base to determine a "first-cut" measure of liabilities,
- adjusting those liabilities on the basis of parameters from CBO's regression model (adjusted liabilities equal a function of the proxy tax base times the statutory tax rate, the change in the proxy tax base times the statutory tax rate, and dummy variables), and
- adding the effects of tax credits and the alternative minimum tax.

Result: projected total corporate tax liabilities.

Step 3
Convert projected tax year liabilities into fiscal year payments by
- applying recent experience in the timing of payments,
- adjusting for recent legislation, and
- adding interest on back taxes.

Result: projected fiscal year tax payments.

Deriving the Tax Base

The process of projecting corporate tax revenues begins with deriving the tax base from CBO's macroeconomic projection of corporate profits. As a part of that projection, CBO forecasts the NIPA measure known as profits before tax. That measure is the closest NIPA approximation to the corporate income tax base. It differs from the more commonly cited NIPA measure of economic profits principally in that it is calculated using a measure of depreciation taken largely from tax returns instead of a measure of depreciation (called economic depreciation) constructed by the Commerce Department's Bureau of Economic Analysis (BEA). Economic depreciation is most relevant to computing the output of the whole economy, but it does not reflect the depreciation deductions allowed on tax returns.

Even so, the NIPA profits-before-tax measure differs substantially from the corporate income tax base. BEA constructs the historical data for that measure by starting from tax-return data (for years available) and adjusting them for consistency with NIPA accounting conventions. As a result, a number of BEA's adjustments make the measure less like the tax base that is necessary for revenue projections. For example, BEA excludes corporations' realized capital gains (which are taxable) because they do not represent earnings from current production. It includes profits of certain entities, such as the Federal Reserve System and credit unions, that do not file income tax returns. And it treats numerous corporate expenditures and other transactions, such as deductions for business meals and entertainment, differently than the tax code does.

To determine a relationship between profits and taxes, CBO first creates a proxy measure of the corporate tax base. CBO starts with the historical values of profits before tax and makes a number of adjustments to more closely approximate profits measured on tax returns—essentially undoing some of BEA's adjustments to create a measure more like the source data with which BEA started.[4] CBO subtracts three BEA additions explicitly identified in the quarterly NIPA reports: Federal Reserve profits, which are not subject to income taxation; state and local corporate income taxes, which are deductible from the federal tax base; and so-called rest-of-world profits, which are the profits that U.S. multinational corporations earn abroad minus foreign corporations' earnings in the United States (as projected in CBO's macroeconomic projection). CBO also makes two adjustments that are based on annual tax-return data: subtracting profits earned by S corporations, which are taxed not as corporate income but rather as personal income to shareholders; and adding corporate capital gains, which are not part of NIPA income.

Approximating Tax Liabilities

CBO produces a first-cut measure of corporate tax liabilities before credits and adjustments by multiplying the proxy tax base by the top statutory tax rate and subtracting an adjustment factor—based on the distribution of corporate income—that captures the typically small amount of income taxed at rates below the top rate. Theoretically, that first-cut approximation should be very similar to actual corporate tax liabilities before credits. However, the approximate and actual measures differ for various reasons: the fact that not all credits are accounted for in adjusting liabilities, shortcuts used in generating the proxy tax base, lack of full corporate

4. For a more complete description of CBO's model for corporate income taxes, see Congressional Budget Office, *The Shortfall in Corporate Tax Receipts Since the Tax Reform Act of 1986*, CBO Memorandum (May 1992). The current model has the same general structure as the one described in that publication, although it now accounts separately for the profits of S corporations and for corporate capital gains.

compliance with tax laws, and the fact that firms may use losses in some years to offset profits that would otherwise give rise to tax liabilities in other years.

To account for those differences, CBO uses an ordinary least squares regression to estimate the historical relationship between its first-cut approximation of liabilities and actual tax liabilities as measured in the NIPAs. The regression's dependent variable is corporate liabilities before the alternative minimum tax and credits—except the foreign tax credit. No measure of the foreign tax credit is needed because CBO's measure of the tax base excludes foreign income of U.S. corporations. Profits are therefore measured on a domestic basis. Data suggest that the United States collects relatively little net tax on foreign-source income and that the amount it does collect is relatively stable as a share of domestic profits.

The first independent variable in the regression equation is the first-cut approximation of liabilities. The second independent variable measures the adjusted top statutory tax rate multiplied by the annual *change* in the proxy tax base. That variable is designed to capture the timing influences of the asymmetries in the tax system, in which firms with losses can carry them back to receive refunds of taxes paid in the recent past or forward to offset future taxes. Dummy variables capture the effect of certain tax-law changes that are not otherwise incorporated in the independent variables.

To project tax liabilities before credits (other than the foreign tax credit), the equation requires projections of several inputs. Profits before tax and rest-of-world profits come from CBO's macroeconomic projection. CBO separately projects Federal Reserve profits, state and local corporate taxes, S corporation profits, corporate capital gains, credits, and liabilities from the alternative minimum tax.

Implied Effective Tax Rates

The regression equation implies a steady-state marginal tax rate on the proxy tax base of about 29 percent. In the short term, however, the rate is several percentage points lower because of the timing effects of the asymmetries in the tax system. In the short term, some newly profitable firms can use past losses to reduce the amount of taxes they owe. Alternatively, some newly unprofitable firms cannot receive refunds of previous taxes paid if they have not paid taxes recently. In both cases, the marginal effect on taxes of the change in profits is smaller than it would be if the tax treatment of profitable and unprofitable firms were perfectly symmetric—namely, if firms automatically received refunds when they registered current losses and paid taxes when they generated current profits. CBO estimates that the effect of those asymmetries on taxes is greater when profits record larger annual changes, as reflected in the equation described above.

Different marginal rates on profits can be calculated, however, depending on the specific measure of profits used. The marginal tax rate on profits before tax implied by the model is lower than the rate on the proxy tax base. The difference results largely from those profits of S corporations that are not taxed as corporate income. Because roughly 20 percent of profits before tax are earned by S corporations, general increases in the dollar value of profits before tax imply smaller increases in the value of the proxy tax base. As a result, the marginal corporate tax rate on profits before tax is closer to 23 percent. The marginal tax rate on changes in profits before tax is closer to 30 percent when the effects of corporate profits on individual income taxes are combined with the effects on corporate income taxes. That higher rate reflects the fact that profits of S corporations are passed on to shareholders and are subject to individual income tax. Individual income taxes must be taken into account to measure the full effect of corporate profits on taxes.

Converting Liabilities to Receipts

Converting the equation's projection of liabilities into receipts is relatively straightforward. Historical patterns of payment suggest that roughly two-thirds of liabilities in a calendar year are paid in the same fiscal year and one-third are paid in the next fiscal year. The projection of liabilities must also include receipts generated by legislation enacted after the sample period from which the equation was estimated. To add that, CBO uses estimates of legislation provided by the Joint Committee on Taxation at the time of enactment, updated for any information subsequently available. CBO also adds in projections of interest from back taxes, which are not included in the NIPA liability data.

CBO's estimating method significantly simplifies the corporate taxpaying process. Nevertheless, although a number of influences are simplified or excluded, it is not clear that modeling them separately would produce significant gains in accuracy. The major source of forecasting error, especially during times when the corporate tax code has not changed substantially, has been the projection of profits.

SOCIAL INSURANCE TAXES

Social insurance taxes contribute about one-third of total federal revenues. They are largely dedicated to various trust funds associated with social insurance programs: Old Age, Survivors, and Disability Insurance (OASDI), also known as Social Security; Hospital Insurance (HI), which is Part A of Medicare; and unemployment

insurance (UI).[5] The tax base for those taxes consists of a certain amount of wage and salary income and income from self-employment. Because of that base, those taxes are often referred to as payroll taxes.

Social Security and Hospital Insurance

Social Security taxes are imposed as a percentage of pay up to a maximum taxable amount ($80,400 in 2001) that is indexed for growth in the economywide average wage. The tax rate is 6.2 percent on both employers and employees. Hospital Insurance taxes are imposed at a rate of 1.45 percent of payroll with no taxable maximum. They also apply to both employers and employees. Self-employed people pay both the employer's and employee's share of those taxes on a measure of their net earnings.

When CBO produces its baseline projection of payroll tax receipts for Social Security and Hospital Insurance, it relies in part on the Social Security Administration (SSA). SSA maintains a model that can project receipts given certain assumptions; it contains information about individuals, including their earnings and payroll taxes. When provided with CBO's macroeconomic projections for wage and salary disbursements, proprietors' income, and employment, SSA projects the maximum amount of a worker's annual earnings that is subject to OASDI tax. Then, also on the basis of input from CBO, SSA projects total earnings (both wages and self-employment) covered by OASDI and HI and multiplies them by the statutory tax rates.[6]

Unemployment Insurance

Federal UI revenues include receipts of both the federal and state unemployment systems. Those receipts are paid into the respective systems' UI trust funds. The Federal Unemployment Tax Act (FUTA) imposes a tax of 0.8 percent on the first $7,000 of an employee's annual wages earned anywhere in the United States. Each state sets its own tax rates and wage limit as well as its schedule of payments to unemployed recipients. Each state's payments are generally limited by the size of its trust fund. FUTA revenues mostly finance administrative expenses of the federal and state systems, but they also fund extended unemployment benefits and repayable advances to states with depleted trust fund reserves. If the federal trust fund reaches certain statutory limits, excess money is transferred to the state trust funds. Although

5. A small portion for social insurance taxes also finance the Railroad Retirement and federal employee retirement programs. CBO's method for projecting those revenues is not discussed in this paper.

6. SSA also produces the tax projections that the Treasury Department uses for its baseline projections.

such limits have yet to be reached, CBO would expect states to respond to the resulting transfers by reducing their tax rates for unemployment insurance.

CBO uses a microsimulation model to project FUTA revenues. That model starts with the distribution of wages of workers from the Census Bureau's Current Population Survey. CBO then projects future wages by applying its macroeconomic projections for employment and wage and salary disbursements to that distribution of wages. Receipts are calculated by applying the statutory tax rate to the taxable portion of wages.

CBO estimates the contribution of state unemployment systems to federal revenues by using a separate regression model. Revenues are projected as a function of CBO's macroeconomic projections for wage and salary disbursements and employment, as well as historical values for states' trust fund reserves and benefit payments. Using those revenue estimates, CBO's budget analysts project the funds' outlays and their consequent condition. The funds' condition, in turn, determines the potential for states to change their UI tax rates, which is incorporated into the revenue estimates.

EXCISE TAXES

Although there are many separate excise taxes, together they account for only about 3 percent of total federal revenues. Just over half of all excise receipts are dedicated to the Highway Trust Fund—most of that from specific levies on motor fuels, especially gasoline (see Table 3). The other half of excise receipts derive largely from specific levies on alcohol and tobacco consumption, an ad valorem (that is, a percentage of value) levy on telephone use, and a mixture of levies on air travel. Most excise taxes—representing roughly 80 percent of total excise revenues—are levied as specific taxes (per unit of good or per transaction) rather than as ad valorem taxes.

As a general rule, CBO's revenue projections assume that current tax laws remain in place and that scheduled changes and expirations occur on time. The sole exception is the treatment of excise taxes dedicated to trust funds. Under the law that establishes certain rules for how CBO's baseline is constructed, those taxes are included in the revenue projections even if they are scheduled to expire. For example, gasoline taxes, which are dedicated to the Highway Trust Fund, are scheduled to expire on September 30, 2005. However, the baseline assumes that those taxes remain in place beyond that date.

TABLE 3. EXCISE TAX REVENUES, 1997-1999 (By fiscal year, in billions of dollars)

	1997	1998	1999
Revenues Dedicated to Trust Funds			
Highway[a]	24.3	31.7	33.8
Airport and Airway[a]	4.9	8.5	9.3
Black Lung Disability	0.6	0.6	0.6
Inland Waterways	0.1	0.1	0.1
Aquatic Resources	0.3	0.3	0.4
Vaccine Compensation	0.1	0.1	0.1
Leaking Underground Storage Tank	*	0.2	0.2
Total	30.4	41.4	44.5
Revenues Not Dedicated to Trust Funds			
Alcohol	7.5	7.4	7.6
Tobacco	5.9	5.7	5.3
Telephone	4.7	4.7	5.2
Transportation Fuels[a]	7.3	0.4	0.5
Firearms and Ammunition	0.2	0.2	0.2
Ozone-Depleting Chemicals	0.1	0.1	0.1
Foreign Insurance Policies	0.1	0.1	0.1
Private Foundations	0.5	0.4	0.1
Other	1.0	0.5	1.0
Unclassified (Including refunds)	0.2	1.0	0.7
Total	27.5	20.5	20.9
Total Excise Tax Revenues			
Total	57.8	62.0	65.4

SOURCE: Congressional Budget Office.

NOTES: Estimates exclude the effects of temporary payment delays enacted in the Taxpayer Relief Act of 1997. Although total excise tax receipts are available for 2000, the components are not yet available. For a description of the tax rates and applicable tax bases, see Joint Committee on Taxation, *Schedule of Present Federal Excise Taxes (as of January 1, 1999)*, JCS-2-99 (March 29, 1999).

* = less than $50 million.

a. Starting in fiscal year 1998, the Taxpayer Relief Act of 1997 reclassified the tax of 4.3 cents per gallon on highway fuels from general revenues to the Highway Trust Fund and the comparable tax on aviation gasoline and jet fuel from general revenues to the Airport and Airway Trust Fund.

Excise Taxes on Motor Fuels

CBO uses an econometrically estimated behavioral equation to forecast gasoline consumption, the major source of excise tax receipts from motor fuels. The equation is a log-linear specification of taxable gasoline consumption as a function of relative fuel prices, real GDP, and average fuel efficiency for gasoline-powered personal vehicles. Relative fuel prices are measured as the GDP deflator for fuel divided by the GDP deflator for all goods and services. CBO estimates a short-term price elasticity of demand of about -0.06, on the low side of recent values reported in the economics literature.[7] Real GDP captures other economic influences related to fuel consumption. CBO projects relative fuel prices and GDP as a part of its macroeconomic projection. Average fuel efficiency is projected separately. CBO estimates that fuel efficiency will continue its recent upward trend (which has occurred despite the increasing market share of light trucks). Projected revenues from taxes on gasoline equal projected gasoline consumption multiplied by the federal tax rate (18.4 cents per gallon under current law). CBO projects taxes on other motor fuels using a simpler procedure.

Other Excise Taxes

CBO forecasts alcohol and tobacco taxes independent of its macroeconomic projection. It projects consumption by extrapolating per capita consumption of those goods based on recent trends—adjusted for expected increases in relative prices of tobacco—and multiplies that extrapolation by projected changes in population. Consumption multiplied by current federal tax rates, including the tobacco tax increase set for 2002, equals revenues.

The telephone tax, levied at 3 percent of telephone charges, generates receipts that CBO projects will grow with nominal GDP, adjusted separately for assumptions about new telephone installations. CBO's projections of revenues for the various taxes that finance the Airport and Airway Trust Fund are based on information provided by the Federal Aviation Administration.

Numerous smaller sources of excise tax revenues exist. In addition, a relatively small amount of receipts is never assigned by the IRS to a specific source. CBO generally uses simpler extrapolations to project the smaller sources of excise revenues, often increasing them at the same rate it projects for nominal or real GDP (depending on whether the tax is levied in a specific or ad valorem manner). Some sources of receipts have been relatively stable over time and are projected to remain

7. The price elasticity of demand measures the extent to which demand for a good changes when its price changes. A value of -0.06 means that a price increase of 1 percent results in a reduction in the quantity demanded of 0.06 percent.

at their most recent annual level. Other sources, such as the amount never assigned to a specific tax, exhibit idiosyncratic patterns that are addressed on a case-by-case basis.

ESTATE AND GIFT TAXES

Estate and gift taxes currently contribute about 1 percent of federal revenues. The estate tax is imposed on transfers of wealth at death, and the gift tax is imposed on transfers during a taxpayer's lifetime. A generation-skipping tax is imposed to ensure that property is not transferred across more than one generation without being subject to taxation. Tax rates on estates and gifts effectively range from 37 percent to 55 percent, although credits built into the system exempt most estates and gifts from taxation. Of the revenue that the government receives, most is generated by the tax on estates.

CBO uses a microsimulation model to project the value of taxable estates and the mix of estate tax rates that applies. The process first generates estimates of taxpayers' wealth. Starting with the wealth held by a sample of families in the Federal Reserve Board's Survey of Consumer Finances for 1998, the model adjusts the population weights to be consistent with the demographic projections of the Social Security Administration. For 1999 and 2000, the model extrapolates components of each sample family's wealth using corresponding measures in the flow-of-funds accounts of the Federal Reserve Board. For the projection period, the model projects wealth on the basis of CBO's projection of GDP growth. Using mortality tables (adjusted for annuitants' life insurance profiles) and a random number generator, the model selects estates from the sample, including an assumed deduction based on an average for that size of estate. It then applies the tax rate schedule and credits to determine the amount of tax generated, if any. Receipts from the gift tax and generation-skipping tax are projected to grow at the same rate as estate tax revenues.

CUSTOMS DUTIES

The United States levies customs duties on its imports of particular goods from selected countries. Such duties now contribute about 1 percent of total federal revenues. That share has been declining in recent years as free-trade agreements and other tariff reductions have been enacted.

CBO forecasts customs duties to grow largely with the nominal value of nonoil imports, as projected in its macroeconomic projection. (Oil imports are subject to a specific tariff that results in a disproportionately small percentage of total duties.) That growth is tempered by the effects of legislation, most notably the

phased-in reductions in tariff rates begun in 1994 by the North American Free Trade Agreement.

MISCELLANEOUS RECEIPTS

Miscellaneous receipts have numerous sources, with the largest piece coming from the Federal Reserve. The second largest share comes from charges dedicated to the Universal Service Fund—a fund collected from telecommunications providers to subsidize basic telephone service for high-cost areas and low-income households and to finance Internet service for low-income schools and rural hospitals. With the exception of Federal Reserve receipts, nearly all miscellaneous sources are projected on the basis of agency- or industry-specific information rather than macroeconomic projections.

As the U.S. central bank, the Federal Reserve earns profits because the interest it receives on its portfolio of Treasury securities greatly exceeds its operating costs. Nearly all of those profits are remitted to the Treasury and counted as revenues (a small portion is added to a capital reserve account). CBO models the value of the Federal Reserve's portfolio as a function of CBO's macroeconomic projections for currency and total reserves on deposit at the Federal Reserve. It divides the projected portfolio into three groups with different maturity dates and applies projected Treasury interest rates to that portfolio to determine Federal Reserve earnings. As a separate step in projecting Federal Reserve receipts, CBO uses its macroeconomic projection of exchange rates to calculate gains or losses on revaluation of the Federal Reserve's holdings of securities denominated in foreign currencies.

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