
CHAPTER III. TREASURY ESTIMATES FOR SPECIFIC TAX MEASURES

In proposing new tax legislation, the Treasury Department estimates the gain or loss that will result from each change in the tax law. Unlike its estimates of aggregate receipts, these projections cannot be verified in terms of later collections because the changes in tax collections cannot be separated into those specifically resulting from changes in the tax law and those resulting from other factors such as economic growth, inflation, and changes in labor market conditions.

COMPUTING THE REVENUE EFFECTS OF A TAX CHANGE USING ECONOMETRIC MODELS

In principle, the problem could be resolved by the use of econometric models that simulate the behavior of the economy under assumed conditions. In this study, the revenue impact of certain tax changes was analyzed with the aid of three large-scale forecasting models--those developed by Data Resources, Inc. (DRI), Wharton Econometric Forecast Associates (Wharton), and the Bureau of Economic Analysis of the Department of Commerce (BEA). These models are used both to forecast future levels of economic activity and to reproduce the historical performance of the economy.¹ It was possible to estimate the gain or loss in revenues from specific tax legislation by running the models to show total revenues both with and without the tax change.² The difference

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1. An excellent illustration of the latter application is contained in Joint Economic Committee, Economic Stabilization Policies: The Historical Record, 1962-1976, November 1978.
 2. In order to produce figures rigorously comparable to the Treasury's revenue estimates, the models should also be run under the same economic conditions assumed by the Treasury in making its projections. Incorporating all of these economic assumptions was not considered practicable, however, and was in any event unlikely to alter the results substantially. See the discussion in Chapter II.

between the two totals provides an estimate of the change in tax revenues caused by the particular legislation.³ The results obtained by this method also provide an indirect measure of the revenue impact of a tax-induced income change--referred to as "revenue feedback."

TREASURY POLICY REGARDING FEEDBACK

The estimates provided by the models of the net revenue impacts of tax changes can be separated into the direct revenue impact of the legislation and the "revenue feedback" effect. When taxes are cut, for example, the direct effect is a reduction in revenues. But the tax cut itself may stimulate increased economic activity and higher incomes, leading to partially offsetting revenue gains. The Treasury takes account of revenue feedback resulting from specific legislation in its estimates of aggregate revenue collections.⁴ Because feedback is embedded in the economic forecasts containing these aggregate estimates, feedback estimates for specific tax proposals or tax law changes are not reported by the Treasury.⁵

The Treasury has been criticized for not reporting revenue feedback for specific proposals. In its own defense, it has argued that providing feedback information both for aggregate

3. The revenue effects of a tax change are sometimes studied by examining only a handful of macroeconomic relationships. This approach simplifies the analysis but excludes many of the complex interactions between variables that are normally captured by more general macroeconomic models. For an example of this "partial equilibrium" approach see Joseph Pechman, "Responsiveness of the Federal Individual Income Tax to Changes in Income," in Brookings Papers on Economic Activity, 1973:2, pp. 385-421.
4. Generally, the Treasury's long-run revenue projections include the induced economic effects of tax law changes upon prices and supply behavior, in addition to their immediate impacts on individual incomes and consumption. Explicit estimates of these effects appeared for the first time in the Carter Administration's FY 1982 Budget (p. 82).
5. See statement of Treasury Secretary W. Michael Blumenthal on The Revenue Act of 1978 (H.R. 13511) delivered before the Senate Finance Committee, August 17, 1978.

revenue collections and for estimates of specific legislation would result in double counting. Estimates of aggregate revenues for a coming fiscal year include feedback because they are based on the Administration's economic forecast. This forecast, in turn, reflects the assumed fiscal impact of enactment of all of the Administration's specific tax proposals. To show this feedback again as a part of the revenue estimates for particular proposals would be to count it twice.

The Effect of Different Accounting Methods

The use of econometric models to assess the Treasury's performance is handicapped because the models do not report revenue data in the same way as does the Treasury. Treasury revenue estimates are based on the unified budget concept, while the econometric models record their information on a national income accounts (NIA) basis.⁶

Unified budget and NIA estimates of federal tax revenues differ in two major ways. First, federal revenues on the unified budget basis are counted only when received, while the NIA method records personal taxes at the time of withholding and corporate taxes as they are accrued. The difference in accounting conventions is especially significant in the case of corporate income taxes, because the payment of the amounts accrued may extend over several years.

The second difference between the two accounting methods is that they do not define personal and corporate tax revenues in the same way. Unified budget figures, for example, distinguish among individual income, gift, and estate tax collections, while the NIA estimates list all three items under the heading of "personal tax collections." Because the econometric models do not distinguish between the elements that comprise the NIA receipts categories, it was not possible to correct for these accounting differences. The differences are not of major importance, however, since the income tax has typically provided 95 percent of all the revenues under the NIA heading of personal tax collections, and the corporate tax has, on the average, accounted for over 90 percent of NIA corporate accruals figures.

6. Table A-3 in the Appendix summarizes the differences between these accounting methods.

Limits to the Precision of Forecast Estimates of Federal Budget Receipts

In addition to the accounting problems described above, accuracy may suffer from the estimation techniques used in forecasting federal revenues. In order to accommodate technical constraints unique to their models, forecasters will often make straight-line projections of complex economic and behavioral relationships. One consequence of this procedure is the loss of some precision in the forecast results. The general rule of thumb adopted by the forecasting profession is that reported estimates should be accurate to within one-half billion dollars. Differences between revenue projections of less than one-half billion dollars are considered insignificant.

ESTIMATING DIRECT EFFECTS USING ECONOMETRIC MODELS

Six changes in the federal tax code were examined retrospectively with the three econometric models, and compared with the Treasury's figures. Four were changes in the individual income tax: the Revenue Act of 1964 (P.L. 88-272), The Revenue and Expenditure Control Act of 1968 (P.L. 90-364)⁷, the Revenue Act of 1971 (P.L. 92-178), and the combined effects of the Tax Reduction Act of 1975 (P.L. 94-12) and the Revenue Adjustment Act of 1975 (P.L. 94-164). Two were changes affecting corporate income tax liabilities: the 1964 act and the 1968 surcharge. The effects of four of the six legislative changes on collections were examined for only a two-year period⁸ because most econometric models cannot isolate the impacts of specific tax measures after a long period of time, nor separate out the effects of subsequent tax measures that alter collections patterns.⁹ Consequently there are 14 sets of estimates: three each for the individual and corporation income taxes under the 1964 act; two each for corporations and

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7. This act is referred to below as the 1968 surcharge.
 8. Treasury estimates of the 1964 act's impact were reviewed for a three-year period because a number of the tax changes resulting from its enactment were first effective in 1965.
 9. This is so in part because not all tax law changes are incorporated into the econometric models.

individuals under the 1968 surcharge; two for individuals under the 1971 act; and two for individuals under the 1975 acts. There are six entries for totals.

In general, subject to the minor qualifications discussed earlier, the models' estimates of direct revenue effects are comparable to those of the Treasury. Certain adjustments to the models' projections of corporate tax revenues must be performed, however, to make them comparable with Treasury figures. In this analysis, a technique developed by the Treasury was used to convert the models' estimates of the effects of specific legislation on corporate tax accruals to a receipts basis. Table 9 describes the results of the simulations with the econometric models.¹⁰

The first three columns of Table 9 contain the models' retrospective estimates of the direct revenue effects of specific tax changes.¹¹ The Treasury estimates appear in the last column. Below the estimates of revenue gains or losses resulting from particular tax law changes are totals representing the cumulative estimates of the direct effects over the period immediately following the legislation's enactment. Some differences in estimates arising from differences in the timing of the receipts are eliminated by this technique, and a comparison of the totals may be more instructive than year-to-year comparisons.

The table shows that the models' estimates both of annual revenue changes and of cumulative effects varied considerably.

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10. The Appendix contains each model's estimate of the change in receipts produced by the five tax law changes. In addition, it describes the statistical techniques applied to the econometric models and lists the variables used to estimate receipts in each model.
 11. These results assume that the Federal Reserve would have held nonborrowed reserves constant in the absence of major alterations of the tax code. This type of monetary policy is often referred to as "neutral." To the extent that the Federal Reserve might have adopted either more restrictive or more expansive policies, the predicted collections levels presented in this report may require some adjustment.

TABLE 9. COMPARISON OF ESTIMATES OF THE DIRECT EFFECTS ON TAX COLLECTIONS OF SELECTED CHANGES IN THE FEDERAL INCOME TAX LAW BY FISCAL YEAR: IN BILLIONS OF DOLLARS

Tax Act	DRI ^a	Wharton ^a	BEA ^b	Treasury
1964 Tax Reduction Act				
<u>Personal</u>				
1964	-2.8	-4.0	-3.0	-2.7
1965	-8.9	-9.2	-9.4	-8.9
1966	-9.9	-13.0	-12.8	-12.6
Total	-21.6	-26.2	-25.2	-24.2
<u>Corporate^c</u>				
1964	-0.1	0.0	-0.1	+0.3
1965	-0.6	-0.3	-0.8	-0.6
1966	-2.3	-0.7	-2.4	-1.0
Total	-3.0	-1.0	-3.3	-1.3
1968 Tax Surcharge				
<u>Personal</u>				
1969	+10.1	+10.7	+8.7	+8.4
1970	+5.4	+5.4	+6.3	+4.6
Total	+15.5	+16.1	+15.0	+13.0
<u>Corporate^c</u>				
1969	+1.2	+0.2	+1.1	+4.8
1970	+3.3	+0.5	+2.8	+3.5
Total	+4.5	+0.7	+3.9	+8.3
Revenue Act of 1971				
<u>Personal</u>				
1972	+3.2	+0.7	+1.8	+0.9
1973	+1.9	-3.3	+4.4	-3.3
Total	+5.1	-2.6	+6.2	-2.4
The 1975 Tax Acts				
<u>Personal</u>				
1975	-9.6	-9.5	-10.2	-9.4
1976	-15.8	-12.0	-12.4	-13.2
Total	-25.4	-21.5	-22.6	-22.6

NOTE: Estimates were made using forecasting models of Data Resources, Inc. (DRI), Wharton Econometric Forecast Associates (Wharton), and the Bureau of Economic Analysis of the Department of Commerce (BEA). These estimates were compared with those of the Treasury Department.

- DRI and Wharton estimates calculated by estimating the tax equations separately from the model.
- BEA estimates based on Treasury unified budget estimates.
- Accruals estimates converted to a receipts basis to conform with Treasury accounting methods.

For example, the estimates of the revenue loss in 1964 resulting from the 1964 act's individual income tax provisions fell between \$2.8 billion and \$4.0 billion, a range of \$1.2 billion. For the 1964 act as a whole, the variation in the estimates approached \$5 billion. Of the 14 estimates generated on each of the three models, the Treasury's projections fell within the range produced by the models half the time. On five of the remaining occasions when the Treasury's estimate was outside this range, the difference between the Treasury and at least one of the models was less than one-half billion dollars, an amount considered insignificant by the estimating profession. In the other two cases, the Treasury's distance from the range of the models would appear significant, but there is no way of telling whether the Treasury or the models were more accurate.

When each of these models was similarly measured against the range formed by Treasury and the other two models, the DRI estimates were outside the range on three occasions, each apparently significant; the Wharton estimates fell outside the range on nine occasions, three of which appear significant; and the BEA model six times produced estimates outside the range of the others, three of which appear significant.

A comparison of the estimated cumulative effects of the five tax changes revealed that in only one instance--the 1968 surcharge--did the Treasury estimates differ substantially from the models' totals. Similar comparisons with each of the models showed that two DRI cumulative estimates fell outside the range of totals formed by the Treasury's and the other two models' projections, all six Wharton totals were outside of their respective ranges, and one BEA estimate was significantly different from the related figures produced by the Treasury and the other models.

These findings suggest that with the exception of the 1968 surcharge on corporate income tax payments, the Treasury's estimates are generally within the range produced by these models' measurement of what occurred. Indeed, the Treasury's estimates of what would occur agree with the models' assessments of what did occur about as well as the models agree with each other on this latter point.

MEASUREMENT OF FEEDBACK EFFECTS

Table 10 shows the models' estimates of the feedback associated with the five tax bills under consideration. These feedback

TABLE 10. COMPARISON OF ESTIMATES OF FEEDBACK EFFECTS RESULTING FROM CHANGES IN THE FEDERAL INCOME TAX LAW BY FISCAL YEAR: IN BILLIONS OF DOLLARS

Tax Act	DRI	Wharton	BEA
1964 Tax Reduction Act			
<u>Personal</u>			
1964	+0.1	+0.1	+0.3
1965	+1.2	+1.0	+0.5
1966	+2.0	+2.1	+0.8
Total feedback	+3.3	+3.2	+1.6
Total feedback as a percentage of total direct effect	(15)	(12)	(6)
<u>Corporate a/</u>			
1964	0	+0.1	+0.1
1965	0	+0.5	+0.5
1966	+0.1	+1.4	+2.4
Total feedback	+0.1	+2.0	+3.0
Total feedback as a percentage of total direct effect	(3)	(200)	(91)
1968 Tax Surcharge			
<u>Personal</u>			
1969	-2.5	-1.0	-0.4
1970	-1.3	-2.9	-0.9
Total feedback	-3.8	-3.9	-1.3
Total feedback as a percentage of total direct effect	(25)	(24)	(9)
<u>Corporate a/</u>			
1969	-0.3	-0.3	-0.1
1970	-0.7	-0.2	-0.2
Total feedback	-1.0	-0.5	-0.3
Total feedback as a percentage of total direct effect	(22)	(71)	(8)

continued

TABLE 10. continued

Tax Act	DRI	Wharton	BEA
Revenue Act of 1971			
<u>Personal</u>			
1972	-0.1	+0.4 <u>b/</u>	0
1973	<u>-0.8</u>	<u>-0.6</u> <u>b/</u>	<u>-0.4</u>
Total feedback	-0.9	-0.2	-0.4
Total feedback as a percentage of total direct effect	(18)	(8)	(6)
The 1975 Tax Acts			
<u>Personal</u>			
1975	+0.7	+0.8	-0.5 <u>b/</u>
1976	<u>+2.4</u>	<u>+2.7</u>	<u>-0.4</u> <u>b/</u>
Total feedback	+3.1	+3.5	-0.9
Total feedback as a percentage of total direct effect	(12)	(16)	(4)

NOTE: Estimates were made using forecasting models of Data Resources, Inc. (DRI), Wharton Econometric Forecast Associates (Wharton), and the Bureau of Economic Analysis of the Department of Commerce (BEA). The feedback effects were calculated by subtracting the direct effects of the tax law changes from the retrospective estimates of the total tax changes.

a/ Accruals estimates converted to a receipts basis to conform with Treasury accounting methods.

b/ Feedback estimate is in the same direction as the corresponding direct estimate.

figures are useful in determining the total change in tax revenues attributable to a particular tax-induced income change. For the most part, the feedback revenue in the initial years following legislation is likely to be quite small relative to the direct revenue effect. For example, the offsetting feedback revenue gain in 1964 resulting from the reduction in the individual income tax was estimated by the models to be between \$100 million and \$300 million.

These estimates should be used with caution, because it is doubtful whether most econometric models can accurately measure changes amounting to less than \$500 million. In four instances in Table 9, for example, the indicated impact of the feedback was in the same direction as the tax change, which is directly contrary to what one would expect. Since the magnitudes in these cases were small, these inconsistencies have been ignored.

In addition, the estimates provided here are limited by the models themselves. For example, the models are not capable of taking into account long-term changes in behavior that alter the relative prices of goods and services. They may therefore be unable to predict the ultimate induced consequences of tax law changes.

The estimates of feedback differed widely both in dollars and in percentages of the direct effects shown in Table 9, particularly with regard to corporate tax changes. Most of this variation probably results from differences in the models' specifications of the U.S. economy. Part of it may stem from differences in timing; feedback estimates of the same general magnitude and direction may fall into different years, giving a very diverse pattern. The timing differences can be at least partially eliminated by adding the separate years' figures for each law change together and comparing the totals for direct revenue effects and for feedback. After making this computation, the feedback effect for the 1964 reduction in personal income taxes was estimated to range from 6 percent to 15 percent of the direct revenue effect, while the feedback effect for the 1964 reduction in corporate taxes ran from a low of 3 percent to 200 percent (see Table 10). The 1968 surcharge for personal income taxes showed a range of 9 to 25 percent and the range for feedback from corporate tax increases under the same act ran from 8 to 71 percent. Estimates of the feedback for the Revenue Act of 1971 ranged from 6 percent to 18 percent, while those for the 1975 tax reduction showed a

range of 4 to 16 percent. If numbers of less than \$500 million are disregarded, the estimates by DRI and Wharton for individual income taxes under the 1964 act, the 1968 surcharge, and the two 1975 acts were within a 4 percentage-point spread and also were very close in dollar amounts. The BEA results in those cases, however, were substantially lower.

CONCLUSION

Treasury Department revenue estimates of specific tax legislation cannot be checked for accuracy by comparing them with actual figures, because actual figures can never be directly observed. In principle, large-scale econometric models can provide a basis for assessing the accuracy of the Treasury's projections. As shown above, however, the models do not generally provide consistent estimates of the direct effects of specific tax changes. This is so in part because the models' revenue estimating equations tend to be less well-developed than other features of the models. Where the models projected consistent estimates, the Treasury's figures usually fell within the range of the models' estimates. Since the models frequently differ on the precise effects of specific legislation, their results fail to yield a single standard by which to evaluate the Treasury's estimates.

The models also fail to provide consistent estimates of the amount of revenue feedback generated by specific tax law changes, particularly those altering corporate tax liabilities. Since revenue feedback cannot be measured directly, this finding suggests that the Treasury's decision to omit feedback estimates for particular tax changes and to include feedback only when estimating aggregate revenue collections is a reasonable one, given the current state of the art.

APPENDIX

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This appendix describes in greater detail how the revenue changes discussed in the text were estimated. It includes a review of the procedures used to estimate tax collections in the absence of a legislated tax change. In addition, two technical issues are explained: how corporate tax accruals are converted into receipts for purposes of comparison with Treasury projections, and how the models' estimates of the effects of particular tax measures are separated into direct effects (similar to those normally presented by the Treasury) and feedback. In explaining these conversions, the DRI model is used. Where differences exist among the structures of the three models, however, the differences are noted.

Personal Tax Collections

The first step in estimating personal tax revenues in the DRI model is to determine the effective tax rate on individual income. Many of the factors that affect this rate are variables representing particular tax legislation that has strongly influenced collections. More general factors, such as the unemployment rate and per capita income, though, are also included in the estimating equation. The full list of these variables appears in the personal receipts sections of Table A-1.¹

The revenue change caused by a tax measure is computed by removing or modifying the variable representing the relevant

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1. The corresponding mechanism in the Wharton model includes references to tax devices such as the personal exemption, the standard deduction, and the statutory tax rates that apply to different income classes as well as a set of variables similar to those contained in the DRI model. The BEA model separates individual income tax receipts into withheld taxes and non-withheld taxes. Only withheld taxes are computed by the model. They are assumed to be determined by the effective tax rate, the tax base, and a series of variables reflecting important tax legislation. This last aspect of the BEA model is similar to the DRI methodology.

TABLE A-1. PERSONAL AND CORPORATE TAX EQUATIONS AS SPECIFIED IN THE DRI, WHARTON, AND BEA MODELS

Model	Estimated Variable	Factors Used to Generate the Estimate
<u>DRI</u>		
Personal Receipts	Receipts	Effective tax rate Taxable income base
	Effective tax rate	Unemployment rate Dummy variable representing '72 overwithholding and '73 correction Dummy for 1964 act Dummy for 1975 act Dummy for 1971 act Variable reflecting timing of collections during '68-'70 surcharge Percent effective change in collections due to rebate or surcharge Log of taxable per capita personal income
Corporate Accruals	Accruals	Statutory rate Before-tax profits Change in the investment tax credit rate Nonresidential investment in durable equipment
<u>Wharton</u>		
Personal Receipts	Log of number of exemptions	Log of total U.S. population

continued

Model	Estimated Variable	Factors Used to Generate the Estimate
	Value of standard plus itemized deductions	Personal income per capita Variables representing tax changes intended to benefit the lower tail of the income distribution, e.g., low income allowance, tax credits Total U.S. population
	Personal taxable income	Adjusted gross income Estimated value of standard and itemized deductions Estimated number of exemptions claimed Value per exemption
	Proportion of taxable income	Estimated per capita taxable income Time trend
	Receipts	Statutory rate for different income classes Estimated proportion of taxable income in each income class Dummy for 1964 act Dummy for 1968 surcharge Dummy for 1972 overwithholding Dummy for 1973 refunds for overwithholding

continued

Model	Estimated Variable	Factors Used to Generate the Estimate
Corporate Accruals	Accruals	Effective corporate tax rate in each sector of the economy Proportion of total value added in the economy by each sector Corporate profits before tax State and local tax accruals Foreign profits Correction for autocorrelation Deposits of earnings by the Federal Reserve Investment tax credit rate in each sector Level of investment in each sector
<u>BEA</u>		
Personal Receipts	Receipts Log of income tax withholdings	Income tax withholdings Nonwithheld taxes Statutory withholding rate Log of wages and salaries Dummy for graduated withholding of 1966 act Dummy for 1975 act

 continued

Model	Estimated Variable	Factors Used to Generate the Estimate
		Correction for auto-correlation Log of index for tax surcharges
Corporate Accruals	Log of accruals	Log of statutory rate Dummy for 1971 act Log of annual average of Wharton index of capacity utilization for manufacturing, mining, and utility sectors Dummy for 1971 act Time trend Dummy for high oil profits originating abroad during mid-1970s Before-tax profits State and local tax accruals Investment tax credits Deposits of earnings by the Federal Reserve Dummy for 1975 act

legislation and recalculating the effective tax rate using the equation described in Table A-1. Historical values of the other explanatory variables in that equation are used. The full model is then simulated to compute an estimate of how much revenue would have been collected during a given historical period had the tax change not been made. Table A-2 presents the levels of collections that were observed when the legislation considered in the text was enacted and the estimated levels that would have resulted if these tax changes had not occurred. The net difference (which includes direct effect and feedback terms) between these historical and hypothetical revenues is the change in revenues attributed to the particular tax policy.

Corporate Tax Accruals

To estimate changes in corporate tax accruals resulting from legislated tax changes, the rate on corporate profits in the corporate equation is reset to its pre-existing level.² The difference between tax accruals projected from this change and the observed level of receipts is then treated as the net effect of a particular tax measure on accruals.

Conversion of Accruals into Receipts

As indicated earlier, corporate tax accruals must be converted into receipts figures for purposes of comparison with Treasury projections.³ The method of adjustment uses a Treasury Department technique for converting corporate tax accruals into receipts.⁴ Estimates of the proportion of accruals paid in each

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2. In estimating changes using the Wharton model, a set of effective tax rates on corporate profits for different sectors of the economy is reset to determine the effect of a specific tax measure. The BEA corporate equation used to forecast tax accruals contains a series of variables reflecting important legislation that, when altered, simulate hypothetical collections.
 3. The differences between NIA and Unified Budget items are outlined in Table A-3.
 4. See Office of Tax Analysis (Department of the Treasury) discussion paper, Estimating Fiscal Year Accrued Federal Corporate Income Taxes, September 1978.

Fiscal Year	Actual Receipts (NIA Basis)	Retrospective Estimate of Receipts Without a Tax Change		
		DRI	Wharton	BEA
Revenue Act of 1964				
<u>Personal</u>				
1964	50.0	52.7	54.0	52.7
1965	51.4	59.1	59.6	60.3
1966	56.7	64.6	67.5	68.7
<u>Corporate Accruals</u>				
1964	25.7	26.3	25.5	25.4
1965	27.1	29.2	26.5	27.2
1966	30.8	34.1	30.2	30.4
1968 Tax Surcharge				
<u>Personal</u>				
1969	90.7	83.1	81.0	82.4
1970	94.4	90.3	91.8	89.0
<u>Corporate Accruals</u>				
1969	37.0	33.8	37.3	33.8
1970	33.0	31.3	31.5	31.1
Revenue Act of 1971				
<u>Personal</u>				
1972	99.5	96.4	98.4	97.7
1973	110.2	109.1	114.1	106.2
The 1975 Tax Acts				
<u>Personal</u>				
1975	127.1	136.0	135.9	137.8
1976	136.5	149.9	145.9	149.3

TABLE A-3. DIFFERENCES BETWEEN UNIFIED BUDGET AND NIA ACCOUNTING METHODS

NIA Category	Components Appearing in Unified Budget			
Personal tax and nontax receipts	Individual income taxes	+	Estate and gift taxes	
Corporate profits tax accruals	Taxes on accrued profits	+	Deposits of earnings by Federal Reserve System	
Social insurance contributions	OASDHI	+	State unemployment insurance	+
				Railroad retirement

NOTE: This table is intended to establish a framework for comparing figures appearing under the two concepts. It is not meant to suggest, however, an identity relationship between the left-hand and right-hand side of each row. A major distinction between the two methods involves timing. The NIA system records personal income tax receipts at the time of payment and corporate income tax receipts on an accrual basis--that is, when profits are earned rather than when taxes are paid. According to the unified budget method, only cash receipts are recorded, regardless of when earned.

quarter were made so that estimates of payments by fiscal year could be computed. Unfortunately, these fiscal year figures vary with economic conditions and changes in tax legislation. Since the nature of these relationships cannot be precisely determined, conversions of the econometric models' figures in this report necessarily assume that the observed distributions of payments remain unchanged.

Direct Effects and Feedback

The adjusted corporate figures and those representing the effects of changes in the personal income tax provisions can be separated into direct effects and feedback. This is done by modifying or removing the variable representing the relevant legislation and recomputing the effective tax rate using the equation described in Table A-1. Historical values for all other variables that help determine this rate in that equation are left unchanged. The recalculated tax rate is then applied to the historical tax base without simulating the model to produce an estimate of the amount of revenue that would have been collected had the tax change not taken place.⁵ The difference between this estimate and actual revenue collections during that period is the direct revenue effect.⁶ The difference between this estimate and

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5. An alternative procedure is applied to the BEA model, because that model is not designed to replicate history. The direct effects of tax laws on receipts are computed separately and then entered into the model to determine the net effect.
 6. This method is inexact for large tax changes and may cause errors of several hundred million dollars in the resulting revenue estimates. This is because the values of the tax base and of the variables that determine the effective tax rate should be the unobserved values that would have occurred in the absence of the tax change, rather than the historical values. If one chose to rely to a greater degree on the models' characterization of economic relationships, the direct effect and feedback effect of various tax changes also could be approximated by estimating these unobserved values. To do so would require that the variable representing the legislation be modified, its effects removed, and the full econometric model simulated. The resulting estimates of the tax

the figure obtained when simulating the model is counted as feedback.

base and of the variables determining the tax rate would then replace the corresponding historical values in the calculation of the direct revenue effect as described in the text. Such a procedure is more in the spirit of the Treasury Department's estimates of direct revenue effects, although it would be even more sensitive to each model's underlying assumptions. The Treasury's estimates are made before the tax change is introduced, using forecasts of the tax base and of other economic variables that do not assume that the change has been made, and that the economy has reacted to it.



