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Lawrence B. Lindsey

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Cambridge, MA 02138
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ABSTRACT

The Economic Recovery Tax Act of 1981 mandated the most substantial reduction in personal income tax rates since the tax cuts of 1964. The rate reductions stimulated debates about the responsiveness of taxpayers to tax rates and incentives, the magnitude of the foregone revenue, and the distribution of the tax burden. This paper provides estimates of these three parameters.

A baseline income distribution was created which took the macroeconomic environment of 1982 as given. This distribution is contrasted with the actual income reported in 1982 to measure the added reporting of income as a result of the rate cuts. The National Bureau of Economic Research TAXSIM model was used to estimate the effects of taxpayer behavior on tax liabilities as well.

Lawrence B. Lindsey
NBER
1050 Massachusetts Avenue
Cambridge, MA 02138

TAXPAYER BEHAVIOR AND THE DISTRIBUTION OF THE 1982 TAX CUT

Lawrence B. Lindsey*

The Economic Recovery Tax Act of 1981 mandated the most substantial reduction in personal income tax rates since the tax cuts of 1964. Beginning in 1982, tax rates were reduced 10 percent from previous levels and the top marginal rate bracket was set at 50 percent. The tax rate reductions stimulated debates about three key issues: the responsiveness of taxpayers to tax rates and incentives, the magnitude of the foregone revenue and its importance in increasing the federal budget deficit, and the implications of the rate cut for the distribution of the tax burden. The present paper provides estimates of the magnitude of these three parameters.

It is the magnitude, not the existence of economic feedback effects which is controversial within the economics profession. For instance, it is well established that the level of economic activity is influenced by the level of taxes levied, although the size, and sometimes the direction of this effect may be disputed. Similarly, the taxation of labor supply or taxation of the return to

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Assistant Professor of Economics, Harvard University and Faculty Research Fellow, National Bureau of Economic Research. I would like to thank Martin Feldstein, Susan McGrath, Andrew Mitrusi and John Navratil for their assistance.

saving affects the level of those activities. There is also substantial evidence that the demand for various commodities related to the personal income tax such as charitable giving and business travel are highly price sensitive.

Regardless of its magnitude, the existence of a behavioral response on the part of taxpayers affects the revenue cost of the tax change. When the Department of Treasury or the Congressional Budget Office analyzes the revenue cost of a reduction in tax rates or the prospective revenue increase from an increase in taxes, it does so in a "behaviorally neutral" context. That is, the feedback effect of higher tax rates on tax revenues is not considered. Many of the estimates of the cost of the act used in the debate about the tax cut and its contribution to the deficit are based on these behaviorally neutral estimates. Furthermore, the magnitude of the rate reduction from 70 percent to 50 percent makes testable the hypothesis that tax rates were being levied above their revenue maximizing level.

The measurement of these magnitudes requires the creation of a baseline estimate of revenue which holds all factors except for taxpayer behavior constant. Thus, the macroeconomic environment of 1982 is taken as given. To the extent that aggregate income was changed by the tax rate reductions, this paper underestimates the total revenue response to the tax change.

The first section examines the existing works on the effect of tax cuts on revenue both from a demand side and a supply side perspective. Other estimates of the effect of the 1982 rate reductions are also considered. The second section describes the methodology used to estimate baseline revenue. The final section presents estimates of the actual revenue cost of the 1982 rate reductions both in the aggregate and by income class.

Section 1: Existing Estimates of the Relation Between Tax Rates and Tax Revenues

The academic investigation of the effect of taxation on economic activity has been divided into two parts: the "demand" side effects of taxes in the macroeconomic context, and the "supply" side, microeconomic decisions, which in the aggregate determine the macro economy. This section examines this literature by first focussing on the demand side impact of tax reductions. Then, the literature on the "supply side" response is considered. Finally, existing estimates of the response to the 1982 tax cut are examined.

A leading proponent of demand side responses is Walter Heller, Chairman of the Council of Economic Advisers in the Kennedy Administration. During that tenure he advocated a substantial reduction in tax rates. That rate reduction, which brought the top rate down from 91 percent to 70 percent and lowered other rates as well, corresponded to an actual increase in both real and nominal tax revenue after its implementation. However, Heller argues that the cause

of this revenue rise had nothing to do with "supply side" effects. Heller argues:

> "The record is crystal clear that it was its stimulus to demand [his emphasis], the multiplied impact of its release of over $10 billion of consumer purchasing power and $2 billion of corporate funds that powered the 1964-65 expansion and restored a good part of the initial revenue loss."[1]

By this line of reasoning, the effect of the Keynesian multiplier on the initial injection of aggregate demand caused by the tax cut produces sufficient added revenue to recapture the initial cut in taxes.

A similar "demand side" evaluation was made by Donald Kiefer of the Library of Congress in studying the proposed Kemp-Roth tax cut. However, Kiefer maintains that Heller's view of the cause of the revenue response to the 1964 rate reductions is empirically impossible:

> For a tax cut to be self-financing, its impact on the economy would have to be so large that the new tax revenue generated would more than compensate for the original revenue loss. Total Federal taxes in the U.S. claim roughly 20 percent of GNP. Thus, for a tax cut to increase Federal revenues, rather than add to the deficit, it would have to increase GNP by a multiple of 5 times its original size or more. No analysis of fiscal policy in the U.S. economy has concluded that such a high multiplier for an overall tax cut is possible. The major econometric models of the U.S. economy all have multiplier effects for various fiscal policies which range from about 1.3 to 2. Therefore, a tax cut will reduce tax revenue by about 60 to 75 percent of the original amount of the reduction, with the remainder replaced by revenue from the feedback effect.[2]

Kiefer was commenting on the original Kemp-Roth tax cut proposal which, in modified form, was enacted into law in

1981. He did not consider any alternative possibilities which might have caused the revenue response of the 1960s. In order to buttress his case, he placed the tax cut in the context of three major macroeconomic models of the economy beginning in 1978. The first year of the tax cut was estimated to cost $25 billion dollars. The models all estimated significant increases in the Federal deficit as a result: $21.1 billion at DRI, $19.8 billion at Wharton, and a $12.4 billion deficit increase from a smaller tax cut at Chase Econometrics. These figures support his claim that the increase in aggregate demand would only be sufficient to recoup 60 to 75 percent of the rate reduction.

It should be noted that when the tax cut experiment Heller described was performed, an accomodative monetary policy was in place. In 1978, the year of the Kiefer study, monetary policy was tighter than in the 1960s, though much more accomodative than during the 1982 tax cuts. Taking account of the monetary regime of 1982, Gregory Mankiw and Lawrence Summers[3] estimated that the demand side effects of the 1982 rate reductions were actually negative. They argue that given fixed cash balances, the effect of the tax cut was to place a higher fraction of funds with households, who have a lower income velocity of money than does the economy at large. The result would therefore be a decline in nominal GNP from the level it would otherwise have attained.

The above discussion makes clear that monetary policy is a choice for decision makers entirely independent of whether or not a tax cut is taking place. A large demand side response to a tax cut can be observed in some instances and a small (or negative) demand side response to an identical tax cut can be observed in other instances. The magnitude of any demand side response does not depend solely on the tax cut, but on other policy variables as well. It therefore makes little sense to evaluate the behavioral response to a tax cut by estimating demand side responses. The present paper therefore ignores these responses by taking the level of nominal income in 1982 as given.

The literature on the effect of taxes on microeconomic decisions, or "supply side" phenomenon, is largely divided into analyses of the demand for specific commodities or the supply of particular commodities. For example, Feldstein,[4] Boskin[5] and many others have noted the effect of capital income taxation on saving and therefore on the long run supply of capital in the economy. Burtless and Hausman[6], Rosen[7] and others have estimated the effect of taxes on labor supply.

These estimates of the detrimental effects of taxation on factor supply were incorporated into a general equilibrium model of the economy by Fullerton, Shoven, and Whalley.[8] Fullerton[9] used this general equilibrium model of the economy to estimate the impact of tax rates on

revenues. Federal, state, and local taxes on both capital and labor were modelled. He concluded that current marginal tax rates on gross labor income (of roughly 32 percent) and reasonable estimates of labor supply elasticities did not suggest that aggregate revenues could be increased by reductions in the average marginal tax rates. Fullerton left open the possibility that tax rate reductions on portions of the schedule -- at the top particularly -- could increase revenue.

Canto, Joines, and Laffer[10] performed a less detailed procedure using a two-sector model with one -- the household sector -- untaxed. A decrease in tax rates causes factors in the household sector to seek the higher net rewards available in the taxable market sector. The revenue maximizing tax rate depends on the output elasticity with respect to tax rates. Their model depends crucially on the absence of income effects and complementarity of production and consumption of public and private goods. However, it reaches the opposite conclusion from Fullerton.

Both of these studies relied on factor supply as the key behavioral response to changes in tax rates. However, there is no reason to suspect factor supply as either the sole or even the dominant way that changes in tax rates affect tax revenue. Changes in portfolio behavior and the form of compensation employees receive may be of more consequence.

For example, Feldstein and Slemrod[11] argued that a reduction in the effective tax rate on capital gains would increase revenue from the sale of capital assets. The data on capital gains tax revenues since then suggests they were probably correct.

Clotfelter[12] suggested a strong relationship between the after-tax price and the use of business travel and entertainment by partnerships. Travel and entertainment expenses reduce partnership gross income. Neither income nor payroll taxes are paid on these expenses. Yet such disbursements may well provide consumption value for the employee or partner, particularly if they include such expenditures as first class airfare, luxury hotel accommodations or spouses' travel costs. As long as the value to the partner of the expense equals or exceeds (1-t) dollars for the marginal dollar expended, such expenses are clearly justified by utility maximization.

Gwartney and Long[13] extended this argument to other aspects of the tax system by noting that many features tend to reduce the personal cost of consumption items. They used variations in state tax rates to consider the effect of tax rates on the reporting of taxable income holding gross income constant. They concluded that for taxpayers with gross incomes in excess of $80,000, lower tax rates would have produced more tax revenue.

Lindsey[14] used the variation in effective marginal tax rates induced by the peculiarities of the maximum tax

on earned income to study a similar measure of tax avoidance. He concluded that reducing the maximum tax rate from 70 percent to 50 percent would probably cost the Treasury nothing and might actually increase tax revenue. All of these latter works stress the importance of avoidance behavior, as opposed to factor supply, as the prime cause of any inverse relationship between tax rates and tax revenue.

In sum, analysis of factor supply elasticities is insufficient to estimate the effect of changes in tax rates on tax revenue. Analysis of the many individual supply and demand decisions which combine to determine the personal income tax base is exceedingly cumbersome. Therefore, the response of revenue to tax rates is best measured in its aggregate form. The 1982 rate reductions provided an excellent experiment about which a number of conclusions have already been drawn. Because tax rates were reduced more at the top end of the income distribution, one indicator of a behavioral response would be an increase in the share of taxes paid by upper income groups. The Wall Street Journal[15] began the public debate over the 1982 rate reductions in an editorial on April 11, 1984. It examined the share of taxes paid by each income group in 1981 and 1982 and found that groups earning over $50,000 paid higher shares. The percent increases in tax shares were most dramatic at the top.

Washington Post reporter John Berry in an April 22

story entitled "Tax Cuts Aren't Working as Promised,"[16] concluded that "Adjusted for changes in their share of total income, the tax burden of the under $25,000 group went up, not down, in 1982." He further argued that "the figures show conclusively that the increase in income for upper-bracket taxpayers is not the result of some burst of entrepreneurial activity or of the rich getting out of tax shelters."

Joseph Minarik[17] argued in Tax Notes that:

> The IRS statistics show taxes of income groups paid in nominal dollars. Thus, the amount of taxes paid by taxpayers with incomes over $50,000 would increase over time for no other reason than inflation. An increasing share of the taxpaying population would be pushed over the nominal $50,000 barrier and their taxes would therefore constitute an increasing share of the total.

Minarik goes on to point out that the tax share paid by people with incomes over $50,000 has risen for over a decade and, "All else equal, this trend would be expected to continue." He also argues that economic fluctuations will alter the distribution of income and the stock market could alter the level of capital gains realizations. However, he did not quantify these effects.

Furthermore, Minarik incorrectly assumed that the tax cut was "approximately equal in percentage terms across the board." In reality, the reduction in the top rate from 70 percent to 50 percent in 1982 represented a 30 percent tax cut while other groups received only a 10 percent rate

reduction. The actual situation was more complicated due to the maximum tax on earned income. Some taxpayers received large rate reductions while others received none at all in these top brackets. Thus, the actual percent tax rate reduction differed both across income groups and within the top income group. Detailed discussions of this effect are provided by Sunley[18] and Lindsey[19].

Finally, the Tax Foundation[20] released figures which appeared to contradict Minarik's analysis. They controlled for the growth in the share of the population by decomposing taxpayers into percentile classes. Their results showed that the highest 5 percent of the population (roughly those over $50,000) paid 36.2 percent of taxes in 1982, up from 35.3 percent in 1981. However, they did not control for changes in the income distribution or estimate the impact of Minarik's other hypotheses.

The array of analytic techniques used by these authors did not resolve the state of confusion regarding the effect of the 1982 tax cuts. It is clear that the use of a nominal dollar amount -- such as $50,000 -- is meaningless in the face of inflation and rising real income. It is equally inaccurate to use a per-tax return measure of income above a fixed bracket. The same mathematics that cause the <u>total</u> number of dollars above a certain bracket to increase <u>faster</u> than inflation causes the <u>average</u> number of dollars per return above that bracket to increase <u>slower</u> than inflation.

The use of a "share of income" measure by the Post or a "share of taxpayers" by the Tax Foundation is also inappropriate for comparing the share of taxes paid by an income group in two different years. Any tax code of an uneven degree of progressivity will produce an uneven change in the share of taxes paid after a change in income even if income shares and taxpayer shares remain the same.

To see why this is so, consider the following example. Assume a simplified world of 5 taxpayers each earning a different multiple of $5,000. Assume also a simplified multi-bracket tax code shown in Table 1 that resembles the current U.S. tax structure.

A 20 percent rise in the general price level, which has an equal proportionate change in everyone's income, does not change the distribution of income among taxpayers. Yet, every taxpayer but the top one saw an increased share of taxes paid even though the share of income did not change. The results are presented in Table 2.

The reason that the share of taxes went up below $25,000 "after adjusting for the share of income" in 1982 as the Post reported was not due to behavioral responses but because these taxpayers are on the steepest part of our progressive rate schedule. Furthermore, although Minarik's effect of more taxpayers being pushed above a certain nominal bracket is correct, he did not note the counter-vailing effect of the tax schedule reducing the share of taxes paid by the well-to-do, all other things equal. The

TABLE 1

Simplified Tax Schedule

Income	Tax
0 - 5000	0
5,000-10,000	10%
10,000 - 15,000	500 + 20%
15,000 - 20,000	1,500 + 30%
Over 20,000	3,000 + 40%

TABLE 2

Shares of Taxpayers, Income, and Taxes

	Taxpayer				
	1	2	3	4	5
Initial Income	$5,000	$10,000	$15,000	$20,000	$25,000
Percent of Taxpayers	20%	20%	20%	20%	20%
Percent of Income	6.7%	13.3%	20%	26.7%	33.3%
Initial Taxes	$0	$500	$1,500	$3,000	$5,000
Initial % of Taxes	0%	5%	15%	30%	50%
New Income	$6,000	$12,000	$18,000	$24,000	$30,000
New Taxes	$100	$900	$2,400	$4,600	$7,000
New % of Taxes	0.7%	6.0%	16.0%	30.7%	46.7%

Tax Foundation's use of taxpayer shares as an adjustment understates this effect. In fact, the tax share paid by the top 5 percent of taxpayers rose in spite of a bias in the tax schedule against this effect.

Although tax shares are used by various authors as a means of comparing results between two years, the above discussion makes clear that tax shares do not provide an adequate means of normalization. The issue of a baseline income distribution for a given year, however, obviates the use of tax shares to measure behavioral responses. Instead, the reported income levels of identical groups of taxpayers can be compared with what might be expected based on macroeconomic trends. The next section outlines the methodology used in this paper to estimate the behavioral response to the 1982 tax rate reductions.

Section 2: Baseline Methodology

The discussion in the last section made clear that comparison of taxpayer groups in two different years did not provide a very good measure of the behavioral response to a tax rate reduction between those two years. Three major measurement hurdles exist. First, it is important to compare equivalent groups of taxpayers. Second, the effect of macroeconomic conditions on the distribution of income must be controlled for. Finally, changes in the tax law other than tax rates must be factored out to isolate the effect of the rate reductions.

A baseline income distribution automatically controls for these factors. The distribution is created from a detailed data base of an earlier tax year and aged to reflect the macroeconomic conditions of the year being studied -- 1982. For this study, the National Bureau of Economic Research TAXSIM[21] model was used in the modelling process. A detailed description of how the baseline was created is contained in Lindsey[22].

However, the comparison of any two different income distributions by income class is tricky, even an actual and a baseline income distribution for the same year. If there is a substantial difference between the actual and baseline situations induced by a behavioral response, then fixed nominal brackets are an inappropriate means of comparison, even if the same year is being used for comparison. The behavioral response, like a rise in nominal income between two years, alters the number of taxpayers in each income group by shifting the income distribution.

In order to control for this problem, the present study measures the changes in income and taxes for fixed numbers or percentiles of taxpayers rather than for fixed income brackets. To form groups for comparison, all taxpayers were ranked according to AGI in the baseline distribution. Then, the number of taxpayers in each income bracket reported in the 1982 Statistics of Income were matched to the corresponding number of taxpayers in the baseline population. For example, the Statistics of Income reported

8,408 taxpayers in the top category "$1,000,000 and over." The top 8,412 taxpayers from the baseline distribution were selected as a comparison group. The next 20,690 taxpayers in rank were matched to the 20,682 taxpayers in the next SOI income bracket -- $500,000 to $1,000,000. The process was repeated until all taxpayers were grouped.

It should be noted that the baseline income distribution is generated from a sample file of taxpayers. Each taxpayer in the file has a sample weight greater than unity. Thus, it was not always possible to precisely target the desired number of taxpayers in each group. However, as Table 3 indicates, the model was calibrated so that the baseline number of taxpayers in each group is extremely close to the desired actual number.

Furthermore, because the baseline and actual income distributions were different, the dollar values of the income brackets are also different. The top 8,408 taxpayers had incomes over $1,000,000 in the actual data, but the top 8,412 taxpayers in the baseline distribution had incomes as low as $767,100. Table 4 illustrates this by describing the dollar brackets defining identical groups of taxpayers in the actual and baseline distributions. For descriptive ease, these taxpayer groups are referred to by their SOI dollar brackets.

This approach compares the taxable income and taxes paid by equal numbers of taxpayers ranked according to their income. For example, the actual taxes paid by the

TABLE 3

Number of Taxpayers in Actual
and Baseline Taxpayer Groups

Taxpayer Group	Percentile Rank	Number of Taxpayers	
		Actual	Baseline
1	top .01%	8,408	8,412
2	next .02%	20,681	20,690
3	next .15%	140,278	140,300
4	next .60%	570,839	571,869
5	next .74%	702,064	700,366
6	next 3.21%	3,057,266	3,056,859
7	next 4.95%	4,716,532	4,728,597
8	next 10.34%	9,862,616	9,854,036
9	next 7.99%	7,621,965	7,613,840
10	next 9.23%	8,803,387	8,811,602
11	next 11.05%	10,534,728	10,535,796
12	next 15.01%	14,306,781	14,316,923
13	next 17.87%	17,039,853	17,055,399
14	bottom 18.83%	17,952,034	17,972,219

TABLE 4

Income Brackets of Actual and Baseline Taxpayer Groups

Taxpayer Group	Percentile Rank	Number of Taxpayers	
		Actual	Baseline
1	top .01%	over $1,000,000	over $783,000
2	next .02%	500,000 - 1,000,000	421,200- 783,000
3	next .15%	200,000 - 500,000	189,050 - 421,200
4	next .60%	100,000 - 200,000	97,530 - 189,050
5	next .74%	75,000 - 100,000	72,560 - 97,530
6	next 3.21%	50,000 - 75,000	48,650 - 72,560
7	next 4.95%	40,000 - 50,000	38,970 - 48,650
8	next 10.34%	30,000 - 40,000	29,500 - 38,970
9	next 7.99%	25,000 - 30,000	24,810 - 29,500
10	next 9.23%	20,000 - 25,000	20,085 - 24,810
11	next 11.05%	15,000 - 20,000	15,450 - 20,085
12	next 15.01%	10,000 - 15,000	10,250 - 15,450
13	next 17.87%	5,000 - 10,000	5,215 - 10,250
14	bottom 18.83%	under 5,000	under 5,215

top 8,408 taxpayers can be compared with how much we would expect them to pay under a different set of tax rates holding macroeconomic conditions constant.

A second advantage of using a baseline income distribution is its ability to control for macroeconomic conditions. The potential problems of changes in the functional distribution of income in society due to changes in the business cycle are avoided. Several of the authors previously cited noted this problem, but none quantified it. A change in the income distribution would have an obvious consequence for the distribution of tax payments.

This is particularly important for the tax cut being studied as there is good reason to expect that 1982 had a different income distribution than earlier years. For example, although aggregate personal income rose 5.9 percent between 1981 and 1982, wages and salaries rose only 5.0 percent and proprietor's income fell 30 percent. On the other hand, personal interest income rose 7.3 percent and transfer payments rose 11.1 percent. Because the different components of personal income are unequally distributed throughout the population, differing rates of change in these components can produce a change in the overall distribution of income.

The use of individual tax returns as the basis for the income distribution permits adjustment for changes in the functional distribution of income caused by those differing rates of change. For example, it may be that the sharp

fall in proprietary income in 1982 caused proprietors to lose their relative position in the income distribution while recipients of interest income rose relatively. The creation of a baseline income distribution for 1982 automatically takes this into account.

Finally, another advantage of using a baseline rather than an intertemporal comparison is that the tax law changes from year to year. For example, the Economic Recovery Act of 1981 made a number of significant changes in the tax law which redefined Adjusted Gross Income and altered the amount of tax owed. Two changes in particular -- the liberalization of IRA eligibility and the two earner deduction -- significantly altered the definition of Adjusted Gross Income (AGI).

The present study incorporated the effect of these legislative changes in the baseline income estimate. In addition, the changes in the child care credit, and the reduction of the dividend exclusion were all simulated as well.

Several points should be made about these data. First, the reduction in taxes provided by these two provisions was quite significant. Together these two provisions cost the Treasury $13.4 billion, more than one third as much as the rate reductions. On average, these provisions reduced taxes 4.3 percent for 1982. The tax reduction was particularly significant for the middle class, where these provisions equalled more than half of the value of the rate reductions.

A second point about these provisions is that studies which used intertemporal comparisons of income or tax data underestimated the level of income reported in 1982 relative to 1981 and therefore the potency of the behavioral response to the tax reductions. These two provisions, which were largely inframarginal, reduced AGI by nearly 2 percent. This is quite significant when one considers that nominal personal income rose only 5.9 percent between 1981 and 1982. Furthermore, considering that the tax rate reductions increased take home pay by only 3 percent at the margin, these other provisions comprise a significant adjustment to income. This is particularly true when the researcher is considering a potential behavioral response to the rate reduction.

A final point about the IRA liberalization and two earner deduction is that studies which measured intertemporal tax shares neglected the relative effect of these changes on different income groups. For example, although taxpayers earning over $100,000 paid over 17 percent of the taxes in 1982, they received only about 7 percent of the benefits of these provisions. These provisions increased the share of taxes paid by these upper income groups by 0.4 percentage points. The use of a baseline income distribution automatically takes these changes into account. It is also possible to separate the cost of these provisions from the impact of the rate reductions in measuring the behavioral response of taxpayers.

Section 3: Comparison of Baseline and Actual Data for 1982

The best summary measure of the behavioral response of taxpayers is taxable income. Taxpayers may alter their behavior by changing portfolio composition or consuming tax favored commodities as well as by altering their factor supplies. All of these behavioral changes are reflected in taxable income. Table 5 presents the actual and baseline taxable income for all of the various income groups reported in the Statistics of Income.

The data show that taxable income was 33.5 percent higher for the top taxpayer group, or top 0.01 percent of the taxpayer population. Among the top 0.18 percent, corresponding to taxpayers who actually reported AGI of $200,000 or more, taxable income was $9.6 billion, or 17 percent more than the level predicted by the baseline. As a group, these upper bracket taxpayers accounted for one third of the total difference between the baseline and actual levels of taxable income.

The next three taxpayer groups, comprising roughly 4.5 percent of the taxpayer population, reported taxable income $7.2 billion higher than predicted by the baseline. This represents a 2.9 percent increase over the baseline for groups corresponding to those reporting between $50,000 and $200,000 of AGI.

By contrast, the next three taxpayer groups, comprising a bit over 23 percent of the taxpayer population, reported $21 billion more taxable income than predicted. This

Table 5
Actual and Baseline Taxable Income for 1982
(Billions of Dollars)

Percentile of Taxpayers Reported AGI (In thousands)	Actual Taxable Income	Baseline Taxable Income	Ratio of Actual to Baseline Taxable Income
TOP 0.01% (over $1,000)	14.89	11.15	1.335
NEXT 0.02% (500-1000)	11.04	8.61	1.282
NEXT 0.15% (200-500)	31.96	28.53	1.120
NEXT 0.60% (100-200)	58.94	57.55	1.024
NEXT 0.74% (75-100)	46.72	45.47	1.027
NEXT 3.21% (50-75)	141.38	136.80	1.033
NEXT 4.95% (40-50)	166.02	161.30	1.029
NEXT 10.34% (30-40)	273.30	262.20	1.042
NEXT 7.99% (25-30)	169.73	164.20	1.034
NEXT 9.23% (20-25)	160.09	159.50	1.004
NEXT 11.05% (15-20)	147.46	146.00	1.010
NEXT 15.01% (10-15)	137.66	141.80	0.971
NEXT 17.87% (5-10)	90.13	95.80	0.941
BOTTOM 18.83% (under 5)	23.92	25.18	0.950

represents 3.5 percent more than the baseline projected for taxpayer groups corresponding to those earning between $25,000 and $50,000. It seems surprising that this group responded more than the higher income group. However, it should be noted that the percentage reduction in tax rates for these three groups was larger than for the groups earning between $50,000 and $200,000. The maximum tax on earned income had already reduced the tax rate for many of the taxpayers in the latter group to 50 percent. Therefore, for many of these taxpayers there was no rate reduction in 1982 at all.

Taxpayer groups corresponding to those earning between $15,000 and $25,000, the next 20 percent of the taxpayer population, reported almost exactly the projected level of taxable income. On the other hand, taxpayers in the bottom half of the taxpayer population, corresponding to those earning less than $15,000, reported substantially less taxable income than the baseline predicted, about 4.2 percent less than the baseline projection.

This decline may seem puzzling until one considers what the baseline income distribution actually represents. The distribution extrapolated an average level of income growth to all taxpayers based on actual data. This average level of income growth includes the behavioral response of taxpayers to the rate reduction, to the extent that it affected macroeconomic aggregates. The behavioral response was largest among upper income groups and less for other

groups. So, when the total response is averaged and applied to all income groups, the result overestimates the effects of macroeconomic and behavioral changes for some taxpayers and underestimates it for others. At the lower end of the income distribution, this overestimates the expected change in income so much that reported taxable income is actually below that predicted by the baseline. Therefore, the data presented in Table 5 do not imply that the total behavioral response to the tax reduction was negative for low income groups.

However, the existence of an aggregate behavioral response in addition to that included in the macroeconomic data is unambiguous. Reported taxable income was $29 billion higher than expected by extrapolation from the actual macroeconomic conditions of 1982. Thus, in addition to whatever changes in nominal taxable income induced by the tax cut, the rearrangement of portfolio, business, and consumption behavior induced an aggregate net increase in taxable income. Examples of this behavior include increased use of cash instead of fringe benefits in compensation by proprietors, reduced itemized deductions such as charitable contributions, and the increased realizations of capital gains. None of these would be detectable in National Income and Product Accounts data.

Given this startling amount of response, it is useful to examine the projections of the baseline income extrapolation and review their plausibility. Between 1981

and 1982, personal income, excluding transfers but including personal contributions for social insurance, rose 5.6 percent. (This measure includes those components of personal income which constitute the tax base.) Adjusting for changes in IRA liberalization and the two earner deduction, the baseline forecasted an increase in adjusted gross income of 5.7 percent over the same period. By contrast, including the response of taxpayers to the rate cut, actual AGI was 6.3 percent higher in 1982 than in 1981. The baseline estimate therefore closely paralleled actual macroeconomic experience while actual growth clearly exceeded what one would expect.

A key issue raised by this response was the effect of tax revenues. As noted above, some of the behavioral response to the rate reductions was included in the macroeconomic conditions used to estimate the baseline. Thus, the measurement of the effect of the rate reductions on tax revenue are limited to two factors: the increased level of taxable income relative to the actual macroeconomic environment and the redistribution of that income among income classes. Because this excludes any supply side effect on the overall economy, it is obviously an underestimate of the behavioral response of revenue to rate reductions.

Analysis of the effect of the rate reduction involves comparison of revenues under four different sets of assumptions. These are presented in Table 6. The first

Table 6

Comparison of Tax Revenues Under Alternative Assumptions

Percentile of Taxpayers (Reported AGI)	Baseline Tax Revenue Old Law	Baseline Tax Revenue: Old Rates but with IRAs,etc.	Baseline Tax Revenue: New Law	Actual Tax Revenue: New Law	Actual Change in Tax Revenue
Top 0.18% (over $200,000)	$26.3	$26.1	$22.9	$26.9	+$0.6
NEXT 0.60% ($100,000-$200,000)	$23.9	$23.2	$21.2	$22.0	-$1.9
NEXT 3.95% ($50,000-$100,000)	$56.5	$53.0	$47.7	$50.7	-$5.8
NEXT 15.29% ($30,000-$50,000)	$95.2	$89.4	$79.8	$84.7	-$10.5
NEXT 17.22% ($20,000-$30,000)	$58.5	$56.4	$49.7	$52.1	-$6.4
BOTTOM 62.76% (under $20,000)	$49.3	$48.2	$41.7	$42.1	-$7.2
TOTAL	$309.7	$296.3	$263.0	$278.5	-$31.2

Dollar Figures in Billions

assumption, labelled "Baseline Tax Revenue: Old Law", assumes that none of the changes in the Economic Recovery Tax Act were made. This column represents the level of revenue to be expected under pre-ERTA law given the base-line income distribution for 1982. As no changes in tax law were assumed, there is no reason to expect any behavioral response. The aggregate revenue figure of $309.7 billion is 7.7 percent more than would have been collected in 1981 in the absence of ERTA. This compares with a 5.6 percent rise in the tax base between these two years.

The second column of Table 6, labelled "Baseline Tax Revenue: Old Rates but with IRAs, etc." represents the revenue which would have been collected if the old tax law remained in place with the exception of the liberalized IRAs and two earner deduction. This column facilitates comparison with the new law by isolating the effect of tax rates from the other changes made by ERTA. A comparison of this column with the first column shows the cost of these other, non-rate changes in the tax law.

The third column, labelled "Baseline Tax Revenue: New Law" represents the level of revenue expected under the actual tax law in place in 1982. A comparison of this column with the other two columns shows the behavior neutral cost of the tax cut in 1982. These costs amount to $33.3 billion in rate reductions and $13.4 billion due to the other provisions of the law.

The fourth column, labelled "Actual Tax Revenue: New Law" shows how much was actually collected in 1982. A comparison of this column with the third column shows the increase in revenue due to the behavioral response to the tax reduction. In total, $15.5 billion more was collected than what was expected given the macroeconomic environment of 1982.

Furthermore, comparison of this fourth column with the first column shows the actual revenue cost of the 1982 tax cut. This actual cost is presented in the final column of Table 6. This shows that the actual cost of the 1982 changes was $32.2 billion. On net, the behavioral response to the rate reduction did not recoup the revenue foregone by the tax cut.

However, among the top income groups, those with reported AGIs of over $200,000, more revenue was actually collected than the baseline projected would be collected under the old, higher rate schedule. This suggests that for these top bracket taxpayers the reduction in tax rates actually led to an increase in tax revenues.

Furthermore, comparison of the actual revenue collected with the estimated cost of the rate reductions shows that a substantial fraction of the cost of the tax rate reductions was recouped. Of the total $33.3 billion estimated cost, $15.5 billion, or 47 percent was recaptured. This suggests that behavior neutral revenue estimates of the cost of rate changes may be off by a factor of two in estimating the

revenue change. These numbers suggest for example, that a 10 percent tax surcharge might only increase revenue by 5 percent, or alternatively, that a 10 percent tax cut might only reduce revenue by half that amount.

Of course, the tax revenue response was not constant across the income distribution. Only about 6 percent of the revenue cost in the bottom income group was recouped. This figure rose to 37 percent for taxpayers reporting income between $20,000 and $30,000 and 51 percent for taxpayers reporting income between $30,000 and $50,000. Roughly half of the revenue cost of the rate reductions was recouped in the next two income groups as well.

The behavioral response to the tax reduction also had a profound effect on the distribution of the tax cut. Table 7 illustrates this. The first column of Table 7 shows the effect on tax revenues of the rate reductions assuming no behavioral response. On average, the 10 percent rate cuts scheduled in the law cost more than 10 percent in revenue. This is due to two factors. First, although tax rates were cut 10 percent, tax credits were not. Thus the percent effect of a rate reduction on revenues minus credits was more than the percent rate cut. This is particularly true at the lower end of the income distribution. The second reason is the reduction in the top tax rate from 70 percent to 50 percent and the abolition of the Maximum Tax on Earned Income. At the very top of the income distribution this caused a more than 10 percent decline in taxes, while

TABLE 7

Percent Change in Taxes Due to ERTA

Percentile of Taxpayers (Reported AGI)	Baseline Effect of Rate Reductions	Baseline Effect of All Provisions	Actual Tax Change	Percent Change in Taxable Income
Top 0.18% (over $200,000)	-12.9%	-12.3%	+2.3%	+16.6
NEXT 0.60% ($100,000-$200,000)	- 8.6	-11.3	-7.9	+ 2.4
NEXT 3.95% ($50,000-$100,000)	-10.0	-15.6	-10.3	+3.2
NEXT 15.29% ($30,000-$50,000)	-10.7	-16.2	-11.0	+3.7
NEXT 17.22% ($20,000-$30,000)	-11.8	-15.1	-11.0	+1.9
BOTTOM 62.76% (under $20,000)	-13.5	-15.4	-14.6	-2.3
TOTAL	-11.3	-15.1	-10.1	+1.9

Dollar Figures in Billions

taxpayers just below this group were more affected by the maximum tax and received less benefit from the rate reduction.

The second column includes the effect of the IRA liberalization and the two earner deduction on the percent change in tax revenues. This column makes clear that the labelling of ERTA as a "tax cut for the rich" was inaccurate. When these other provisions are included, the smallest percent reductions occur at the top of the income distribution. Furthermore, while the top tax bracket saw its full cut in 1982, other tax brackets were scheduled to be cut a further 14.5 percent during 1983 and 1984. The two earner deduction was also scheduled to double in 1983. When these effects are taken into account, the overall percent reductions in taxes under ERTA were scheduled to be two to three times greater in the middle income ranges than at the top.

When behavioral factors are included, as illustrated by the actual tax change shown in column 3, it becomes even clearer that the tax reduction was skewed to the middle income groups. Taxes at the very top of the income distribution actually increased while other income groups saw total tax reductions ranging up to 14.6 percent. On average, taxes were reduced a bit over 10 percent in 1982 from the levels they otherwise would have attained.

The final column presents the percent change in taxable income between the baseline and actual results. This

column illustrates two important points. First, as noted earlier, the baseline income distribution tended to overestimate the total level of income which would have occurred in the absence of the rate reduction. Because the full behavioral response included in the macroeconomic aggregates was averaged over the distribution, the lowest income groups had a level of baseline income higher than what they actually reported. The 2.3 percent decline in taxable income for these groups represents an estimate of how much additional behavioral response existed.

Second, it should be noted that a given percent change in taxable income will present a greater percent change in taxes. This is because of the progressive nature of the bracket structure of the income tax. All increments to taxable income are taxed at the taxpayer's marginal tax rate, which is generally substantially above the taxpayer's average rate.

For example, consider the $30,000-$50,000 income group. The baseline effect of the tax law changes was an estimated 16.2 percent decline in taxes. But, this income group actually saw a decline in taxes of 11 percent. The 5.2 percent difference in taxes between baseline and actual experience is made up by an expansion of the tax base. In this case, the base expanded by 3.7 percent. However, because this 3.7 percent increase was taxed at the taxpayer's marginal tax rate, a 5.2 percent increase in total taxes ensued.

In conclusion, the data presented here makes clear that there was a significant behavioral response to the rate reductions of 1982. On average, about half of the revenue which would have been lost due to the rate reductions was recouped. Furthermore, the data suggest that for top bracket taxpayers, an actual increase in revenue occurred. It therefore seems likely that the revenue maximizing top marginal tax rate for the personal income tax is below the 70 percent statutory rate which existed prior to 1982.

FOOTNOTES

[1]Walter Heller, "The Kemp-Roth-Laffer Free Lunch." (reprinted from the Wall Street Journal, July 12, 1978, p. 20.) in The Economics of the Tax Revolt: A Reader, Arthur B. Laffer and Jan P. Seymour, eds., pp. 46-49.

[2]Donald Kiefer, "An Analysis of the Kemp/Roth Tax Cut Bill." In The Economics of the Tax Revolt: A Reader, Arthur B. Laffer and Jan P. Seymour, eds., pp. 46-49.

[3]Gregory Mankiw and Lawrence Summers, Are Tax Cuts Really Expansionary?, NBER Working Paper No. 1443, (Cambridge, Mass.: National Bureau of Economic Research).

[4]Martin Feldstein, "The Rate of Return, Taxation, and Personal Savings," The Economic Journal 88 (September 1978): 482-87.

[5]Michael Boskin, "Taxation, Saving and the Rate of Interest," Journal of Political Economy (April 1978): 513-27.

[6]Gary Burtless and Jerry Hausman, "The Effect of Taxation on Labor Supply: Evaluating the Gary Negative Income Tax Experiment," Journal of Political Economy 86 (December 1978): 1103-30.

[7]Harvey Rosen, "Taxes in a Labor Supply Model with Joint Wages-Hours Determination," Econometrica (May 1976): 485-587.

[8]Don Fullerton, John B. Shoven, and John Whalley, "General Equilibrium Analysis of U.S. Taxation Policy," In 1978 Compendium of Tax Research, p. 47.

[9]Don Fullerton, "On the Possibility of an Inverse Relationship Between Tax Rates and Government Revenues," Journal of Public Economics 19, pp. 3-22.

[10]Victor A. Canto, Douglas H. Joines, and Arthur B. Laffer, "Tax Rates, Factor Employment and Market Production," The Supply Side Effects of Economic Policy (St. Louis: Center for the Study of American Business).

[11]Martin Feldstein and Joel Slemrod, "The Lock-In Effect of the Capital Gains Tax: Some Time Series Analysis," Tax Notes August 7, 1978.

[12]Charles Clotfelter, "Tax-Induced Distortions and the Business-Pleasure Borderline," The American Economic Review 73 (December 1983): 1053-65.

[13]James Gwartney and James Long, "Income Tax Avoidance and an Empirical Estimation of the Laffer Curve," Florida State University Mimeo, July 1984.

[14]Lawrence B. Lindsey, "Alternatives to the Maximum Tax on Earned Income," in Behavioral Simulation Methods in Tax Policy Analysis, Martin Feldstein, ed. (Chicago: University of Chicago Press, 1983).

[15]The Wall Street Journal, "Tricklenomics," 11, April 1984, p. 32.

[16]"Tax Cuts Aren't Working As Promised," The Washington Post, 22, April 1984, Sec. G, p. 1.

[17]Joseph J. Minarik, "The Tax Shares Boomlet," Tax Notes, June 11, 1984.

[18]Emil Sunley, "The Maximum Tax on Earned Income," National Tax Journal (December 1979): 543-52.

[19]Lawrence B. Lindsey, "Is the Maximum Tax on Earned Income Effective?" National Tax Journal (June 1981): 249-255.

[20]Tax Foundation, Inc., "Top Earners Get Short Shrift As All Others Get 3.9% Cut Under ERTA," June 8, 1984, Mimeo.

[21]The TAXSIM Model is operated by the National Bureau of Economic Research, Cambridge, MA.

[22]Lawrence B. Lindsey, "Creating A Baseline Income Distribution for Tax Data", mimeo, October 1985.

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