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ESTIMATING THE REVENUE MAXIMIZING TOP PERSONAL TAX RATE

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ABSTRACT

The idea that marginal tax rates and tax revenue may be inversely related is at least as old as Adam Smith's Wealth of Nations. The emergence of the "Laffer Curve" in the modern public debate on the subject has rekindled interest in this idea. The present paper uses data from the 1982 tax rate reductions to estimate the revenue maximizing top personal tax rate.

This paper also examines the components of taxable income to consider the sources of taxpayer response to changes in marginal tax rates. The National Bureau of Economic Research TAXSIM model was used extensively in this study to estimate the magnitude of taxpayer response to tax rate changes.

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ESTIMATING THE REVENUE MAXIMIZING TOP PERSONAL TAX RATE

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The possiblility that marginal tax rates and tax revenue may be inversely related has received an increasing amount of attention in recent years. The so-called Laffer Curve suggests that above a certain point, higher marginal tax rates will produce lower revenue. However, this idea is at least as old as The Wealth of Nations. Adam Smith argued:

> High taxes, sometimes by diminishing the consumption of the taxed commodities, and sometimes by encouraging smuggling, frequently afford a smaller revenue to government than what might be drawn from more modest taxes.[1]

Most modern economic analyses of taxation focus on the issue of excess burden or economic efficiency and neglect the relationship between tax rates and tax revenue. This neglect is a corollary of the objective being studied. When minimizing the excess burden of taxation subject to a revenue constraint, tax rates above the revenue maximizing point on the "Laffer

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Curve" are irrelevant to consideration. At the revenue maximizing point, the excess burden of an additional dollar of revenue is infinite because the behavioral response of taxpayers makes collection of additional revenue impossible.

Even at tax rates slightly lower than the revenue maximizing level, the additional excess burden caused by collecting the added funds is likely to be well in excess of the shadow price of government revenue. Therefore, some of the mystique associated with the maximand of the Laffer Curve is misplaced. Consider for example the claim of Jude Wanniski, a proponent of the Laffer Curve, regarding its maximum point:

> It is the point at which the electorate desires to be taxed. At (lower rates), the electorate desires more goods and services and is willing -- without reducing its productivity -- to pay higher rates consistent with revenues (at the maximum point)...It is the task of the statesman to determine the location of (the maximum) and follow its variations as closely as possible.[2]

Far from being a preferred rate of taxation, the Laffer Curve's maximum point represents a limiting case. Statesmen should be aware of its location only as a level of taxation to be avoided.

Fullerton[3] used a general equilibrium model to test the hypothesis that tax rates were above the revenue

maximizing point and concluded they were not. However, his model limited taxpayer response to rate changes to factor supplies. However, behavioral responses which affect tax revenue are not limited to factor supply. For example, Feldstein and Slemrod[4] argued that lowering the tax rate on capital gains would increase tax revenue. Clotfelter[5] found a strong relationship between tax price and the use of business travel and entertainment deductions by partnerships. Gwartney and Long[6] and Lindsey[7] found a negative relationship between tax rates and tax revenue for high income individuals and noted behavioral responses which were unrelated to factor supply.

A recent study[8] performed using the National Bureau of Economic Research TAXSIM model concluded that roughly 40 percent of the revenue loss from the 1982 rate reductions was recouped by the behavioral response of taxpayers. This implies that, in general, the income tax system is levied at rates below the revenue maximizing level.

However, the evidence also indicated that top bracket taxpayers, representing the top 180,000 tax returns, actually paid more taxes under the lower rates than what was to be expected under the earlier, higher set of tax rates, given the macroeconomic environment of 1982. This suggests that the revenue maximizing top tax rate of the personal income tax is below the 70 percent level which prevailed prior to 1982.

The purpose of the present paper is to take a detailed

look at the 1982 data to estimate the revenue maximizing top tax rate. Section 1 summarizes the available data, proposes a means of modelling the results, and estimates the model. Section 2 applies the resulting parameters to the current distribution of income to find a revenue maximizing top marginal tax rate. Section 3 examines the various components of taxable income to consider the sources of taxpayer response to tax rates.

Section 1: The 1982 Tax Base

Estimation of the behavioral response of taxpayers to changes in tax rates involves comparison of the actual behavior of taxpayers with an expected behavior given the initial tax rate structure. In this study, the National Bureau of Economic Research TAXSIM model was used to create a baseline, or expected, income distribution for 1982 given the historic relationship between macroeconomic conditions and taxable income. This baseline was then contrasted with the actual level of taxable income in that year.

The TAXSIM model permits behavioral modelling at a highly disaggregated level. The taxpayers in the baseline data set were ranked according to income and then compared with taxpayers of identical rank in the actual data. For example, the top 8408 taxpayers in the 1982 Statistics of Income reported incomes over $1,000,000. They were matched against the top 8408 taxpayers in the baseline income distribution. The next group of taxpayers in the

Statistics of Income -- the $500,000 to $1,000,000 group -- were then matched against taxpayers of identical rank in the baseline distribution. The process was repeated until all taxpayers were grouped.

The results are presented in Table 1. The actual taxable income of the taxpayers in each group is contrasted with the amount of taxable income historic relationships would predict from taxpayers equally situated in the income distribution.

The data show that taxable income was 33.5 percent higher for the top taxpayer group, or top 0.01 of the taxpayer population. Among the top 0.18 percent, corresponding to taxpayer incomes of $200,000 or more, taxable income was $9.6 billion. This represents 17 percent more than the level predicted by the baseline. The difference between the actual and baseline levels declines down the income distribution, and the baseline level exceeds the actual level at very low incomes.

If personal income tax revenues are inversely related to the level of marginal tax rates at some point, it is because they affect the incentive to realize increased amounts of taxable income. The marginal after-tax value to the taxpayer of a change in taxable income is one minus the taxpayer's marginal tax rate.

The marginal after-tax value of taxable income was computed for each taxpayer group using the baseline income distribution for both ERTA and the pre-ERTA tax laws. In the case of pre-ERTA tax law, each taxpayer had two

Table 1

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

marginal tax rates computed: one for wage income and one for interest income. A weighted average of these rates was then computed for each taxpayer where the weights depended on the shares of earned and unearned income in total income. This averaging method corrected for the peculiarities of the Maximum Tax on Earned Income and the earned income credit. It therefore represented the share of income the taxpayer would keep if his income from all sources rose 1 percent. The resulting average rate also corresponded to the effective tax rate on incremental amounts of itemized deductions. Each tax return was then weighted by its sample weight in the tax file to obtain an average marginal rate for its taxpayer class.

Table 2 presents these tax rates and the resulting ratio of marginal after-tax values under the post-tax cut and the pre-tax cut rate schedules. The table compares this ratio with the ratio of taxable incomes in the actual and baseline income distributions.

Figure 1 plots the relationship between after-tax shares and taxable income. A positive relationship between the ratio of actual to baseline taxable income and the ratio of after-tax shares is clearly indicated. Similarly, an intercept value below unity is apparent. That is, taxpayers with little or no change in their tax rates, and therefore their after-tax shares, reported actual income below the level predicted by the baseline.

The reason for this latter observation can be found in

TABLE 2
Marginal Tax Rates Before and After Tax Cut

Percentile of Taxpayers Reported AGI (In thousands)	Old Law Marginal Tax Rate	New Law Marginal Tax Rate	Ratio of New to Old After-Tax Shares	Ratio of Actual to Baseline Taxable Income
TOP 0.01% (over $1,000)	58.49%	49.06%	1.227	1.335
NEXT 0.02% (500-1000)	60.97	47.76	1.338	1.282
NEXT 0.15% (200-500)	61.79	48.55	1.347	1.120
NEXT 0.60% (100-200)	56.47	48.00	1.193	1.024
NEXT 0.74% (75-100)	50.52	45.17	1.108	1.027
NEXT 3.21% (50-75)	44.53	39.47	1.091	1.033
NEXT 4.95% (40-50)	38.86	34.13	1.077	1.029
NEXT 10.34% (30-40)	32.85	28.91	1.057	1.042
NEXT 7.99% (25-30)	29.33	26.39	1.042	1.034
NEXT 9.23% (20-25)	26.81	24.30	1.034	1.004
NEXT 11.05% (15-20)	23.92	21.21	1.036	1.010
NEXT 15.01% (10-15)	20.31	18.02	1.029	0.971
NEXT 17.87% (5-10)	18.48	14.18	1.052	0.941
BOTTOM 18.83% (under 5)	4.43	3.49	1.010	0.950

RESPONSE OF TAXABLE INCOME TO TAX RATE

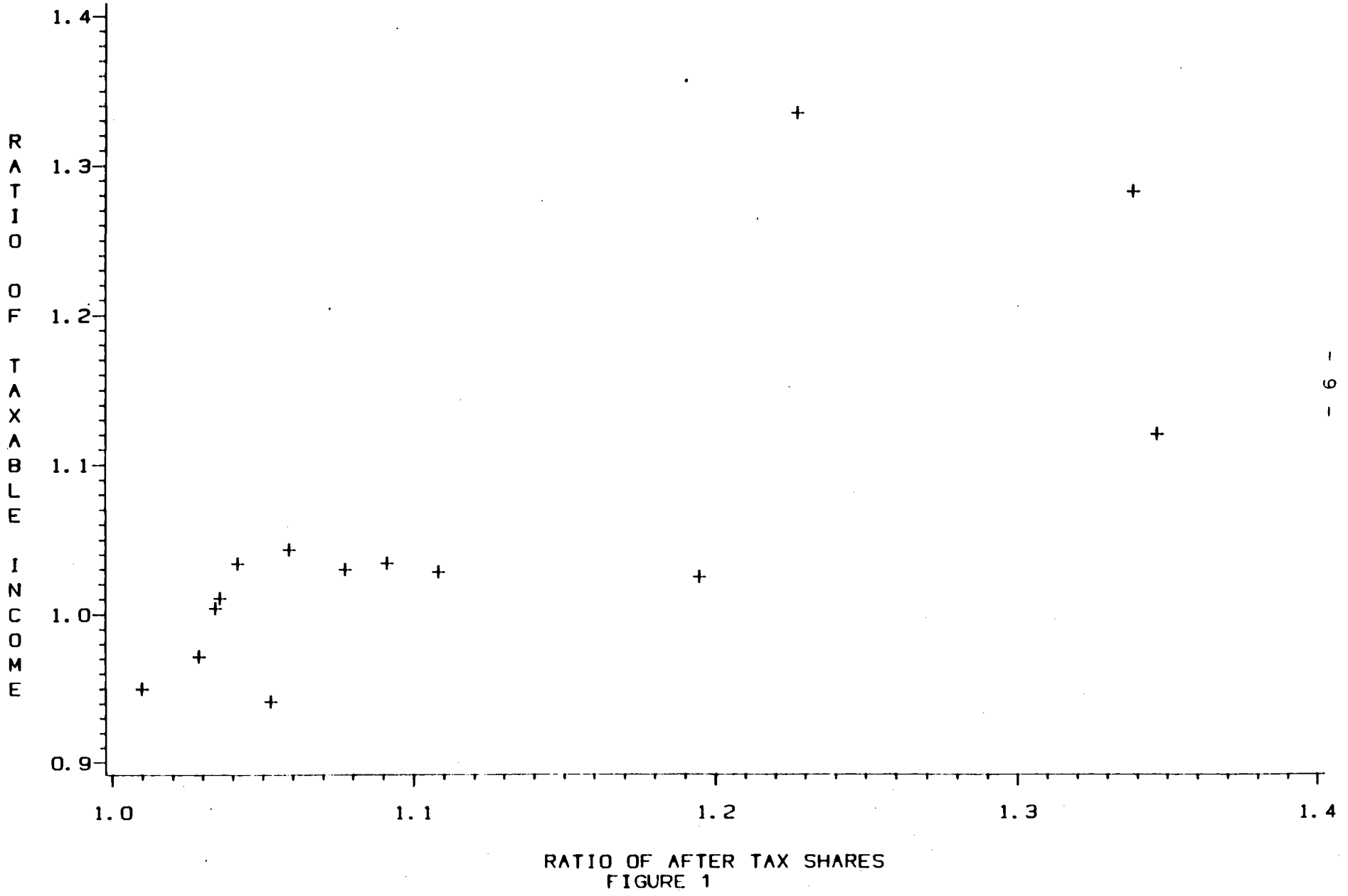


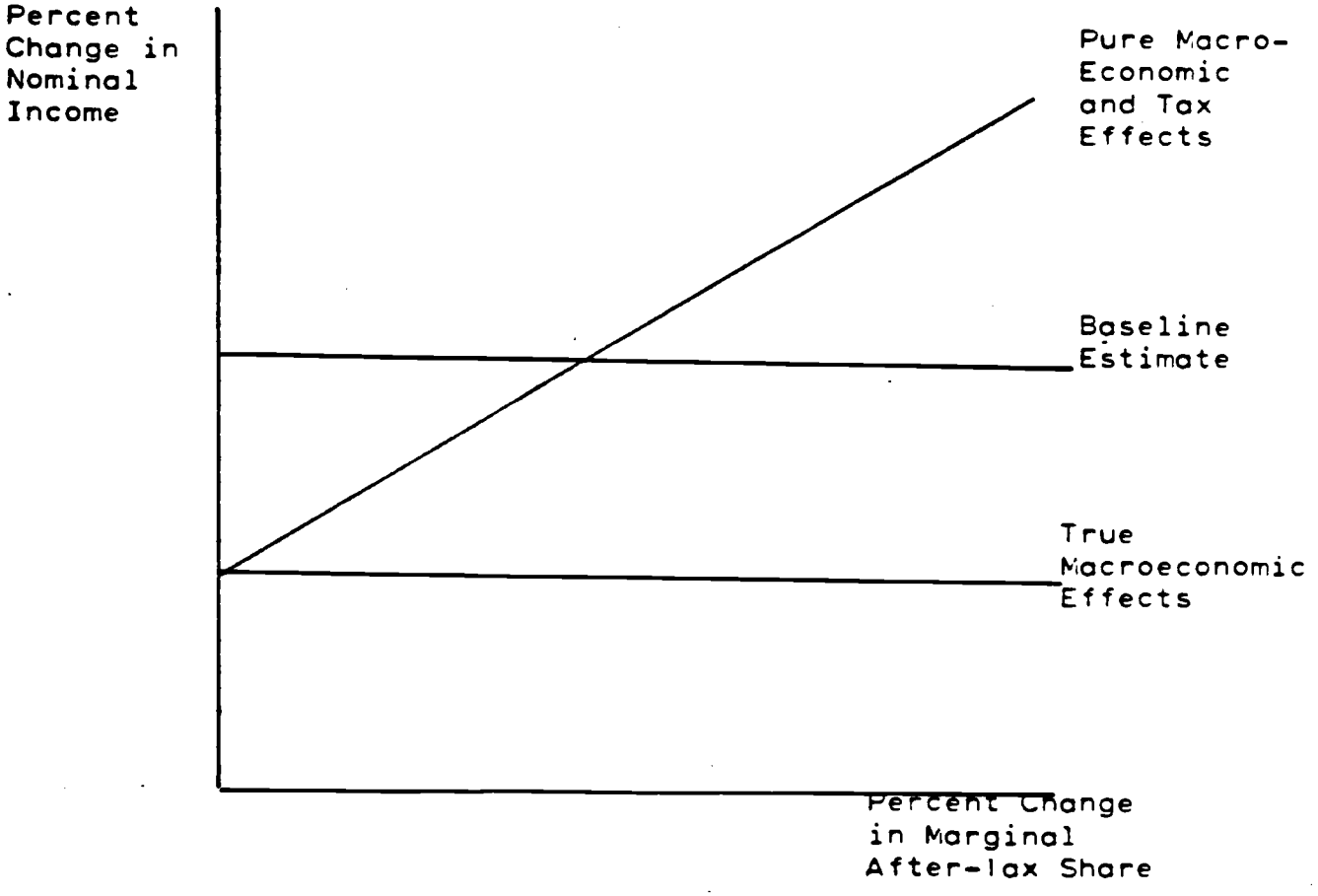
FIGURE 1

the means used to create the baseline income distribution. That distribution relied on the actual macroeconomic conditions of 1982 to determine the baseline level of taxable income. If there were a behavioral response to the rate change which affected the macroeconomic conditions of 1982, it would be reflected in the baseline income distribution for that year. To the extent this were true, the baseline distribution overestimates the true level of income. This overestimate is allocated proportionally across the population on the basis of income.

It is interesting to note that the actual behavioral response creating this overestimate was uneven across the population. In particular it was concentrated on people with large changes in their marginal tax rates. Therefore, taxpayers with little change in their tax rates receive a disproportionately large share of this macroeconomic feedback from the rate reductions. The baseline therefore exceeds their actual level of income.

Figure 2 illustrates this phenomenon. The line denoted "True Macroeconomic Effects" represents the level of taxable income which would have occurred had there been no rate reductions. On the other hand, the "Baseline Estimate" includes both the exogenous macroeconomic situation and any behavioral feedbacks which resulted from the rate reductions which changed the macroeconomic situation. In the baseline, these aggregate macroeconomic feedback effects are distributed evenly across all income

FIGURE 2


Percent Change in Nominal Income
Pure Macro-Economic and Tax Effects
Baseline Estimate
True Macroeconomic Effects
Percent Change in Marginal After-Tax Share

groups. Thus, the "Baseline Estimate" is modelled as a parallel line above the "True Macroeconomic Effects."

However, the actual effects of the tax change varied with the changed incentive to realize taxable income. Upper bracket taxpayers saw their rate reduced from 70 percent to 50 percent while persons not subject to income tax saw no change in their tax situation. These tax effects, represented by the line labelled "Macroeconomic and Tax Effects," therefore are modelled as beginning at the "True Macroeconomic Situation" line and rising thereafter.

By averaging the macroeconomic feedback effects from the tax rate reduction across all taxpayers to obtain the baseline, the result exceeds the true measure of these effects for some taxpayers, and underestimates it for others. However, the variable response of taxpayers in different tax situations permits estimation of both the behavioral response to the tax rate reduction and the amount of overestimate of the true macroeconomic situation by the baseline.

The data can be fitted to a model describing a constant elasticity response to marginal take-home shares. The amount of income a taxpayer would have reported had he had a zero marginal tax rate, or alternatively, if there were no tax system, will be denoted -- C_i -- and the take home share of income at the margin as -- $(1-t)_i$. "Y_i" represents the taxable income the taxpayer reports given

C_i and $(1-t)_i$. We can denote these parameters with a subscript "0" to indicate an initial tax situation noted in Equation 1.

$$(1) \qquad Y_{0i} = C_{0i}(1-t_{0i})^{\beta}$$

Alternatively, the ratio of two taxable incomes in two different tax situations can be expressed with this model as in equation (2):

$$(2) \qquad \frac{Y_{1i}}{Y_{0i}} = \frac{C_{1i}}{C_{0i}} \frac{(1-t_{1i})^{\beta}}{(1-t_{0i})^{\beta}}$$

or reduced to equation (3) if $C_1 = C_0$.

$$(3) \qquad \frac{Y_{1i}}{Y_{0i}} = \left\{\frac{1 - t_{1i}}{1 - t_{0i}}\right\}^{\beta}$$

Under this formulation, if the tax rates in the two regimes are identical for a given individual -- $t_{1i} = t_{0i}$ -- then the reported taxable incomes should also be identical. Given that there was a tax rate reduction for all taxpayers in 1982, only taxpayers with no tax liability -- $t_{1i} = t_{0i} = 0$ -- would have the same income -- $Y_1 = Y_0$. Furthermore, assuming $\beta > 0$, all taxpayers would report income greater than that projected by the baseline: $Y_1 > Y_0$.

However, as noted above, the baseline income distribution was an overestimate of the true baseline as

the macroeconomic aggregates on which it was based included behavioral feedback from the tax rate reduction. That implies that $C_{1i} < C_{0i}$, that the exogenous factors assumed in the baseline were higher than their true values for 1982. Note, however, that since the exogenous factors were computed at the aggregate level, there is no reason to expect that C_{1i}/C_{0i} differs over the income distribution.

Therefore, the value of C_{1i}/C_{0i} is computable. A linear regression equation given by equation 4 can be estimated with the null hypothesis that $C_{1i} = C_{0i}$.

$$(4) \qquad \ln\left(\frac{Y_1}{Y_0}\right)_i = \ln\alpha + \beta \ln\left(\frac{1-t_1}{1-t_0}\right)_i + \varepsilon_i$$

The intercept term in the regression equation would provide the extent of the overestimate in the absence of any tax change. That is, if $t_1 = t_0$, we would expect no change in taxable income: $Y_1 = Y_0$. If the baseline differs from the actual tax data, it will be picked up by α ,where α is the value of the intercept.

The sample on which the data is based is stratified so that roughly equal numbers of observations, averaging about 1500, are provided for each income group. These relatively large samples for each group suggest that the variance of the values for each group is likely to be small and, given roughly equal numbers of observations, unlikely to vary much among groups. Therefore, the use of weighted least

squares to provide estimates corrected for hetero-skedasticity is not required. Equation (5) reports the results of the regression where Y is defined as taxable income:

$$(5) \qquad \ln \frac{Y_{1i}}{Y_{0i}} = \underset{(-0.0356)}{-0.0164} + \underset{(0.2239)}{0.7466} \ln \frac{(1-t_{1i})}{(1-t_{0i})}$$

The standard errors for the regression are in parentheses below the corresponding estimate. In equation (5), the elasticity of taxable income with respect to the after-tax share at the margin is about 0.75 and is significant. The intercept parameter, α, has the expected sign. This indicates that the baseline does overestimate the actual macroeconomic situation of 1982, but it is not significant. Given these parameters, the next section estimates the revenue maximizing top marginal tax rate by applying them to the current distribution of income.

Section 2: The Revenue Maximizing Top Marginal Rate

The preceding section estimated that the elasticity of taxable income with respect to a taxpayer's marginal after-tax share was 0.75. This parameter can be applied to the current distribution of income and tax schedule to compute a revenue maximizing top marginal personal income tax rate.

Consider first the case of a proportional income tax

levied at rate "t" on an individual with taxable income equal to Y_i. Given the model described above, we can describe the taxes paid by an individual, T_i, as a function of the marginal tax rate and the taxpayer's income if there were no taxes, C_i.

$$(6)\quad T_i = tY_i = tC_i(1-t)^{\beta}$$

In the case of a proportional tax described by equation 6, the revenue maximizing tax rate is a function of "b":

$$(7)\quad t^* = 1/1+\beta$$

A value of β of 0.75 implies a revenue maximizing tax rate of 57 percent. The revenue maximizing tax rate does not depend upon income. Increases in t above this point will reduce taxable income proportionately more than the percent increase in the tax rate.

However, if the tax system is not proportional, and if inframarginal income is taxed at a rate unrelated to the top marginal rate, increases in t will reduce taxable income by the same amount, but will gather additional revenue from the higher rate on fewer inframarginal dollars. A lower revenue maximizing tax rate is implied.

Consider a tax system described by a top marginal tax rate, m, applied to all income above level Z. Inframarginal dollars up to rate Z will be taxed at a rate v, which is not dependent on m. Rate v may be higher or lower

than m, but a higher v reduces to the trivial observation that lump-sum taxes are least distortionary. Both theoretical and practical interest focus on a value of v lower than m. The tax on a taxpayer with income Y_i higher than Z is defined by equation (7).

$$(8) \qquad T_i = vZ + m(Y_i - Z) = vZ + mC_i(1-m)^{\beta} - mZ$$

With this more complicated tax system, a higher top marginal tax rate implies the same loss from a lower taxable income as the proportional tax system, but a gain from the higher rate only on $Y_i - Z$. The result is that the revenue maximizing top marginal rate varies with income. To model this we require the income distribution for taxpayers with taxable incomes in excess of Z, the income threshold at which the top marginal rate begins. The revenue collected from taxpayers below this level of income, and the tax liability on the first Z dollars of income are assumed to be unchanged. If we define a function f(Y) as the distribution of taxpayers reporting taxable incomes of Y and n as the number of taxpayers with income over Z, the revenue maximizing top marginal tax rate becomes:

$$(9) \qquad m^* = \frac{1 - \dfrac{nZ}{\int_Z^{\infty} f(Y)YdY}}{1 + \beta - \dfrac{nZ}{\int_Z^{\infty} f(Y)YdY}}$$

Estimation of this parameter requires an iterative procedure because f(Y) is dependent on the value of m which is chosen. Convergence is dependent upon the local properties of the distribution of income. The current tax structure and income distribution seem appropriate starting points for discovering at least a local maxima.

In 1986, the value of Z is scheduled as $174,900. Estimates using the NBER TAXSIM model for the 1986 tax year suggest 226,000 taxpayers will have taxable incomes over that level. The total taxable income of that population is approximately 90.4 billion. The value for the final term in equation 8 therefore equals 0.437. A revenue maximizing top marginal tax rate of 43 percent is therefore implied.

As noted above, the distribution f(Y) is dependent on the level of the tax rate selected. The 43 percent top rate increases the reporting of taxable income and also the number of taxpayers with taxable incomes above the threshold amount Z. In equation (9), the nZ term in the numerator of the last term increases proportionately more than the income term in the denominator at this point in the income distribution. This causes the revenue maximizing tax rate to fall. The 43 percent rate therefore represents an upper bound on the top rate for the income tax.

In order to calculate a lower bound, the bracket structure of the President's proposals for tax reform was used, with the top bracket beginning at $70,000. Again, simulations for 1986 were performed which found 2,233,000

taxpayers with taxable incomes in excess of this amount. Total taxable income for these taxpayers was $308.2 billion. Using this calculation, a revenue maximizing top marginal tax rate of 40 percent is implied. It should be emphasized that these top marginal rates do not represent a social optimum except in the extreme case that government revenue is valued infinitely more than private consumption.

The above analysis held the tax levied at an income of Z constant while lowering the top marginal tax rate. This change would require alteration of the bracket structure below income Z in a multiple rate bracket system such as that which describes current U.S. tax law. Consider for example a constant elasticity model of a form described by equation 9 for incomes up to and including Z:

$$T_i = \tau Y_i^{\rho} \tag{10}$$

In this case, the income elasticity of tax revenue equals ρ, which also is the ratio of the marginal tax rate to the average tax rate. Such a tax system also defines the tax rate at Z, the point where the top marginal tax rate is applied. To avoid any non-linearities, it is necessary that this top tax rate, m, be defined by equation 10.

$$m = \rho\tau Z^{(\rho - 1)} \tag{11}$$

If such a top rate were not defined, the tax system described above would ultimately produce a marginal tax rate in excess of 100 percent.

The assumption of this tax rate schedule places another constraint on the computation of the revenue maximizing top marginal tax rate. In the case described above, the tax liability collected at Z was unchanged but the marginal tax rate at Z was allowed to fall. Equations (10) and (11) show that this only can be done if the progressivity of the income tax, indicated by ρ , is cut, and the scaling parameter, τ , is increased.

Reduction of the top marginal tax rate would therefore lower the apparent progressivity of the bracket structure. If we constrain the progressivity of the bracket structure to its current level, the revenue maximizing tax rate is defined by equation 12:

$$(12) \qquad m^* = \frac{1 - \dfrac{(1-\rho)nZ}{\rho \int_Z^\infty f(Y)YdY}}{1 + \beta - \dfrac{(1-\rho)nZ}{\rho \int_Z^\infty f(Y)YdY}}$$

The income elasticity of the current bracket structure around income Z is 1.36. Computation using the figures above suggests a revenue maximizing top marginal tax rate of 54 percent in this case.

However, two points should be made about this revenue maximizing rate. First, the higher value of the revenue maximizing top marginal tax rate is due to the added revenue collected on inframarginal dollars. If the progressivity of the income tax is held constant and the scaling parameter, τ , is increased, taxes at income Z and

all incomes below that level will also rise. This will compensate for the corresponding reduction in the tax base resulting from the higher rates. A corollary of this is that across-the-board rate reductions to achieve a given top marginal tax rate will produce a higher revenue maximizing value for the top rate than simple reduction in the top rate.

Second, the progressivity that is being preserved in this case is the apparent progressivity of the bracket structure, and not the distribution of the tax burden. If for example, we reduced the top rate from the current 50 percent to 43 percent and left the inframarginal tax brackets unchanged, the taxes paid by upper income individuals would rise while everyone else's taxes would stay unchanged. The apparent progressivity of the tax structure would be reduced because these added taxes from the rich result from higher taxable income overwhelming the lower income elasticity of tax revenue.

Section 3: Tax Rates and the Components of Income

In considering the behavioral response of taxpayers to rate reductions, it is important to note that some components of income appear more responsive to changes in tax rates than do others. The following charts illustrate the relationship between after-tax shares and the reporting of income in 1982.

Figure 3 shows the relationship between AGI and tax rates. As in Figure 1, the ratio of actual to baseline income is plotted on the y axis while the ratio of the after-tax share after the tax cut to the after tax share before the tax cut is plotted on the x axis. Again, as in the case of taxable income, a distinctly positive slope is present.

Figure 4 shows the response of wages to tax rates. Again, a pronounced positive relationship between reported wages and after tax shares is evident. An intercept term below unity is also implied. The baseline income distribution includes an imputation for the effect of the high unemployment rate in 1982. The data suggest that the behavioral feedback from the tax reduction raised wages above what they otherwise would have been in the NIPA data and therefore in the baseline. This change would be averaged across all income groups making the baseline higher than the actual value for low income groups.

The increase in wages was particularly dramatic in high income groups. Wages and salaries were nearly $5 billion -- 20 percent -- higher than predicted by the baseline for taxpayers with AGI over $200,000. This may seem surprising in light of the pre-existing Maximum Tax on Earned Income for eligible taxpayers. However, as both Sunley[9] and Lindsey[10] have shown, the tax was ineffective at reducing the marginal tax rate on earned income to 50 percent. For example, only 32 percent of all taxpayers in brackets of 50

RESPONSE OF AGI TO TAX RATE

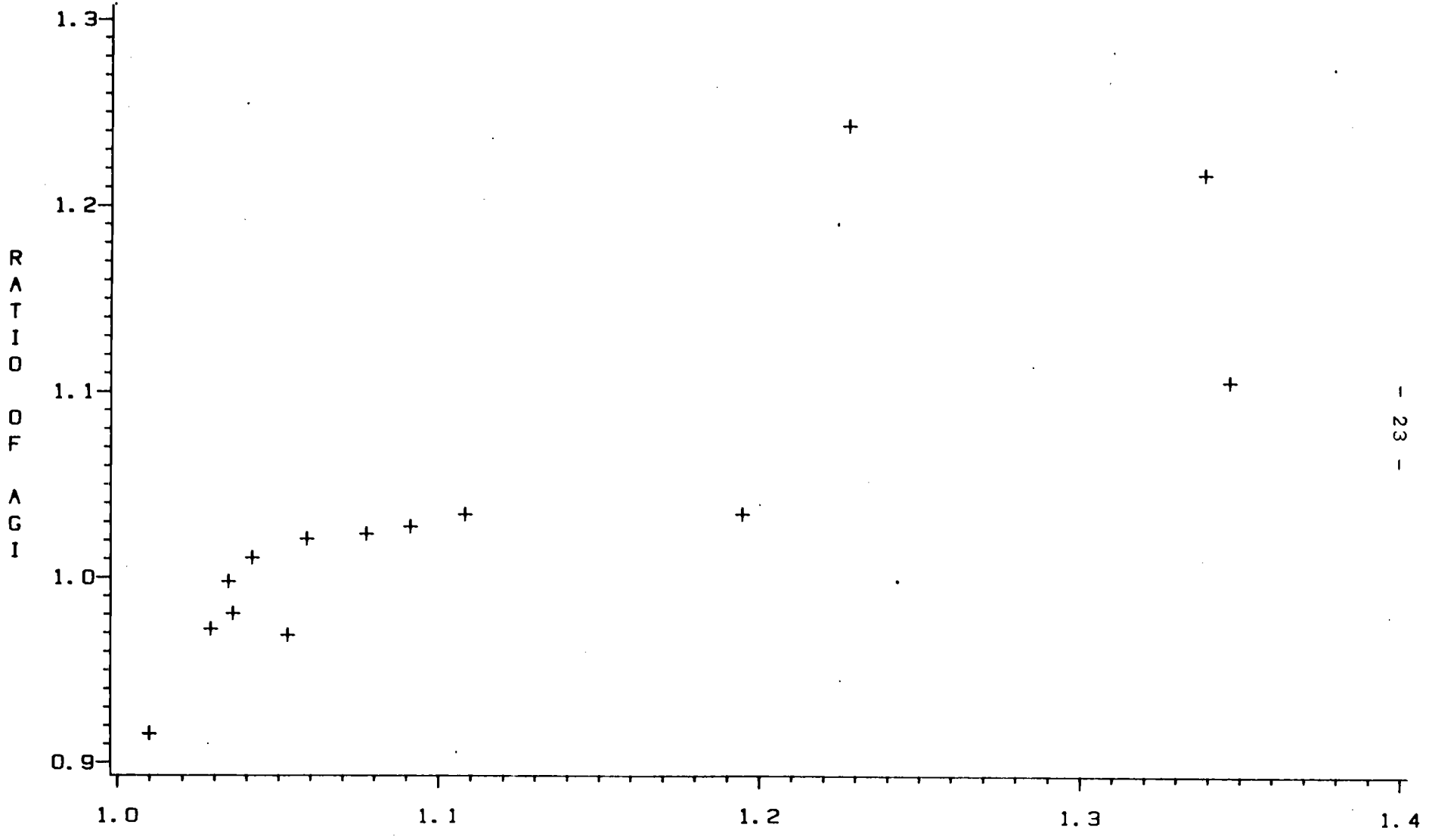


FIGURE 3

RESPONSE OF WAGES TO TAX RATE

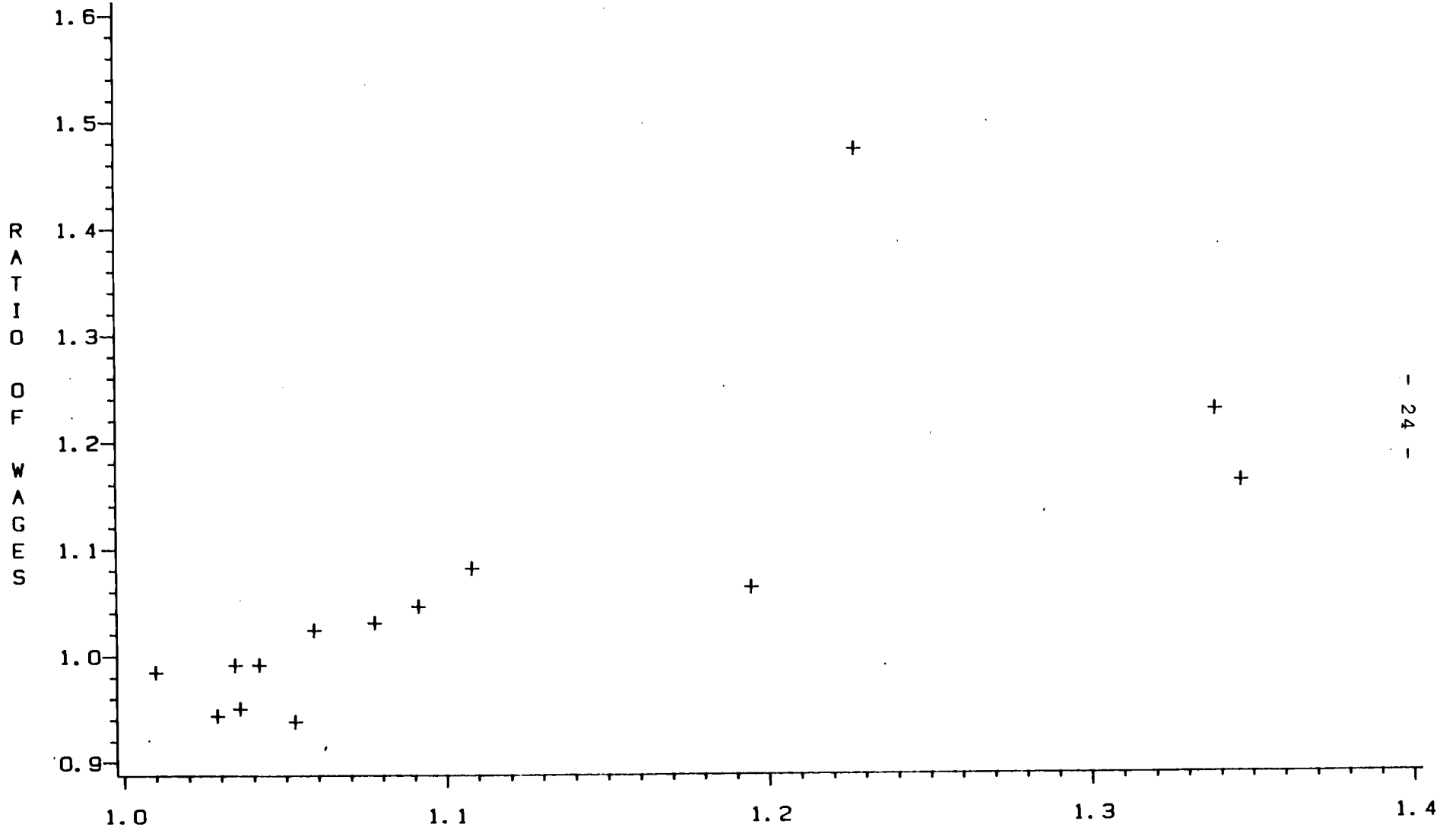


FIGURE 4

percent or higher were eligible for the maximum tax provisions in 1977. In view of this, it is not surprising that a response to rate reductions occurred for wage and salary income among these top bracket taxpayers.

The level of wages and salaries may also be relatively discretionary for these high income groups. The behavioral choice for these taxpayers may be between higher cash compensation and business expenses with consumption value such as automobiles, travel, and entertainment. Given earlier optimization of these forms of compensation at the higher historical tax rate which existed before the change in the tax law, it is not surprising that a lower actual tax rate in 1982 would produce a level of taxable compensation above what was predicted by that baseline.

It must also be stressed that these figures do not imply that the increase in wages and salaries was paralleled by increased effort or labor supply. Although some labor supply response might be expected, the bulk of the explanation is probably a rearrangement of compensation to suit the new tax regime. The many studies of labor supply elasticities of prime age males -- comprising most of this group -- do not support a response sufficient to explain increases of this magnitude in the wages, salaries and business incomes of the rich. Furthermore, the tax cut also involved an increase in income for these people that would tend to discourage effort.

This unexpected level of wages for high income taxpayers was paralleled by a dramatic elevation of reported business income by the same group. Business income reported by taxpayers in the top three taxpayer groups was 88 percent -- $1.2 billion -- higher than predicted by the baseline. This type of income had the largest percent difference between the baseline and actual data of any income category in any income class. It was particularly striking because among taxpayer groups corresponding to taxpayers reporting less than $100,000 of AGI, the baseline overpredicted business income by more than $1.0 billion.

Figure 5 illustrates this response of business and professional income (reported on Schedule C) to the tax rate change. Interestingly, this rise in business income in top brackets came in spite of liberalized depreciation rules which would tend to lower business income, not increase it. The effect of the 1981 tax act had the unambiguous effect of lowering the price of cash compensation to high income professionals. However, the effect on non-cash compensation was ambiguous. Although accelerated depreciation lowered the price of such items as company cars and office equipment, the marginal rate reduction had the effect of raising this price of fringe benefits relative to cash compensation.

It should also be noted that in both the case of business income and in the case of wages, the actual

RESPONSE OF BUSINESS INCOME TO TAX RATE

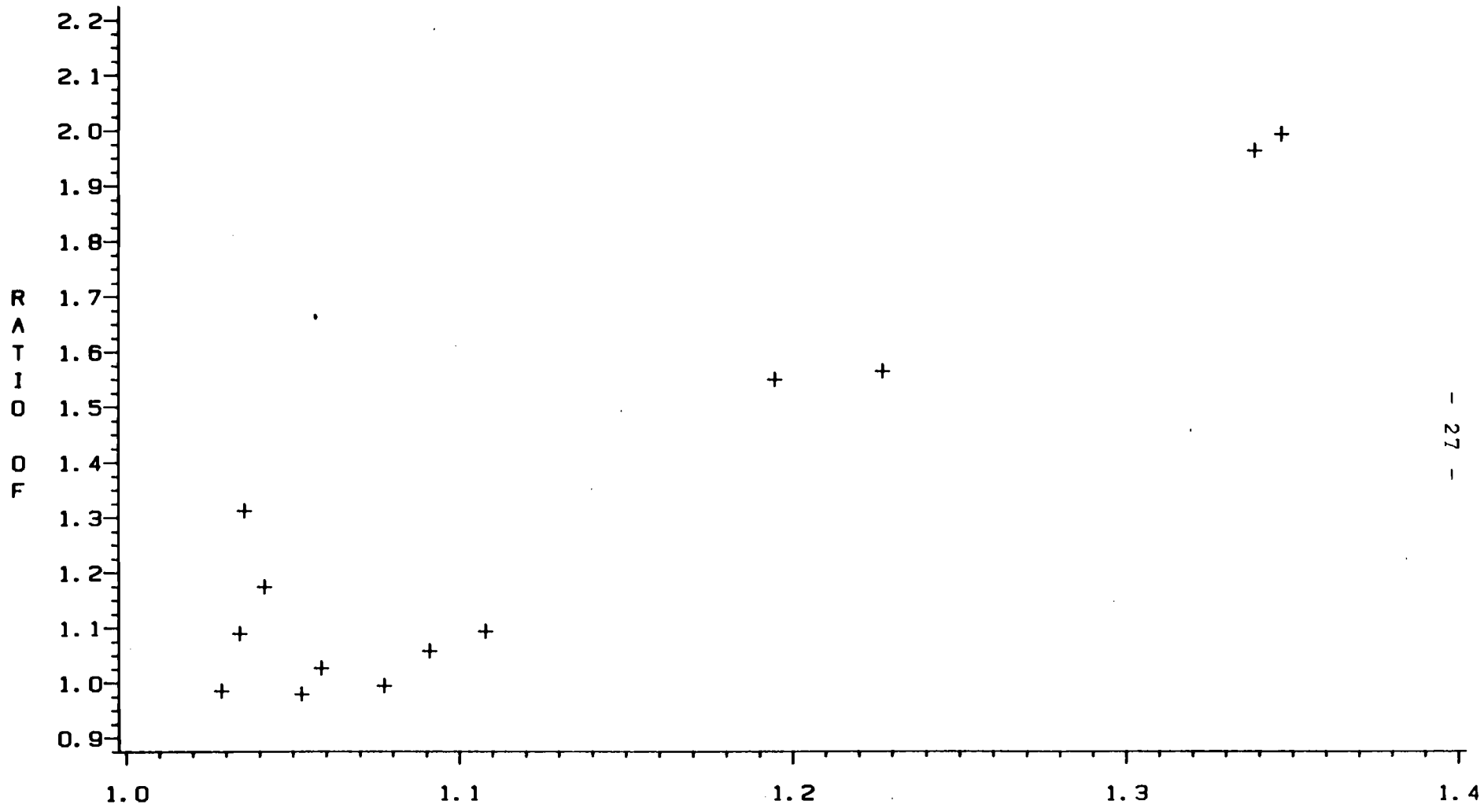


FIGURE 5

behavioral response was probably greater than reported here. The increased reporting of wages and salaries and business profits due to lower consumption of fringes by the rich raised the total level of these forms of income in the national income accounts. This, in turn, was reflected in a higher baseline level of these types of income for all groups including the rich.

Figure 6 illustrates the relationship between capital gains reported in AGI to tax rate. The top 5 income groups (AGI over $75,000) all had higher than anticipated capital gains while all but one income group under that level of AGI had lower than expected capital gains. These data imply that the change in capital gains receipts was the result of the tax rate change rather than overall investment conditions. The largest tax rate reduction for capital gains, like other income, came from taxpayers in tax brackets over 54 percent. These began with taxable incomes of $60,000, roughly corresponding to an AGI of $75,000.

Top bracket taxpayers saw a decline in their effective rate on long term gains from 28 to 20 percent. Other taxpayers received a reduction in their capital gains rate equal to only 4 percent of their ordinary tax rate. For example, a taxpayer in the 25 percent tax bracket saw a reduction in his capital gains tax rate from 10 percent to 9 percent.

RESPONSE OF CAPITAL GAINS TO TAX RATE

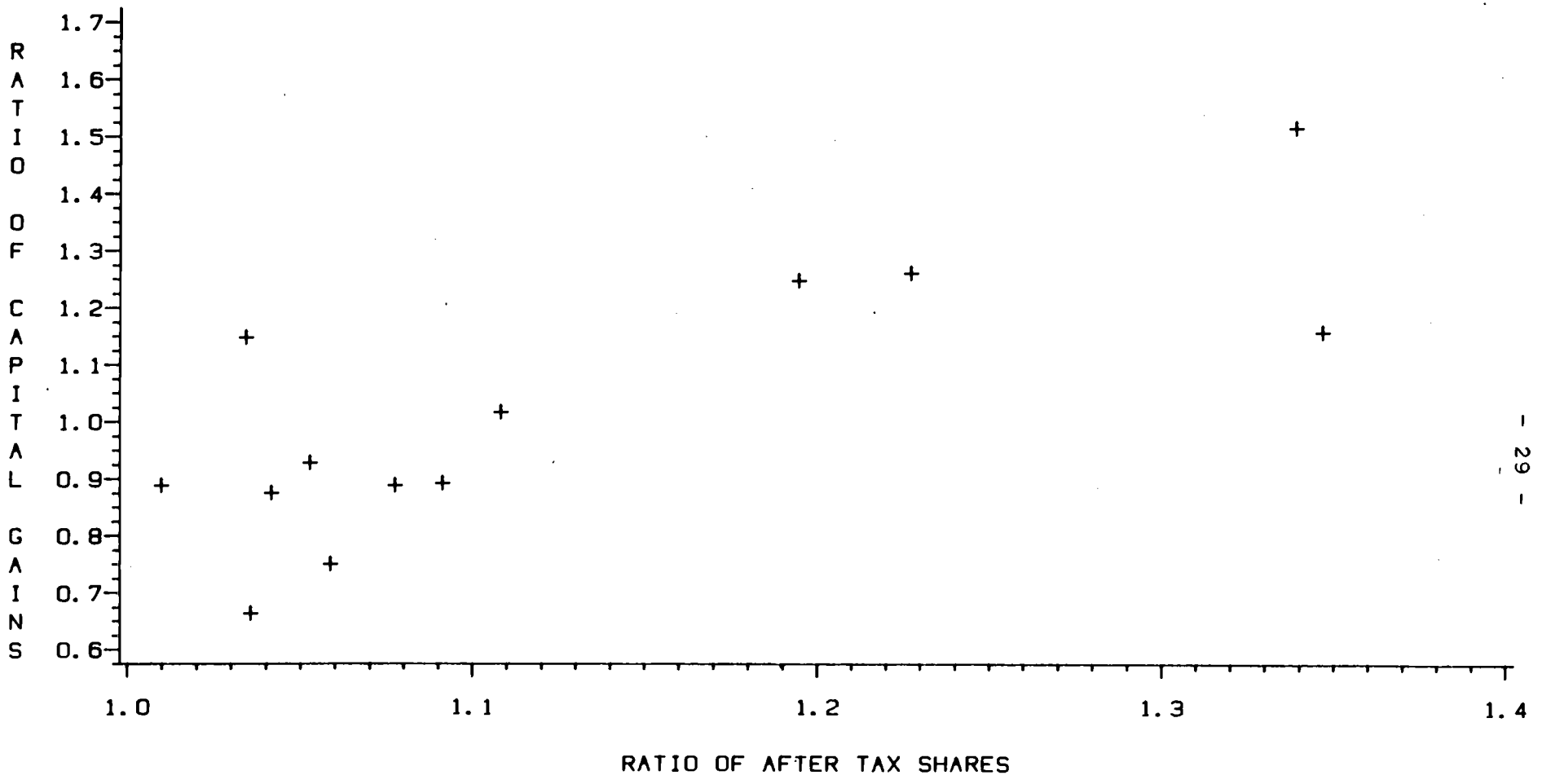


FIGURE 6

Taxpayers in the over-$200,000 group reported capital gains $3.1 billion -- 27 percent -- higher than predicted by the baseline. This large increase in capital gains realizations by the rich occurred in spite of the fact that capital gains declined by $1.2 billion or 7 percent for the population earning under $100,000 between the baseline and actual data. This decline may well have been the result of a stock market which averaged lower in 1982 than in either of the 2 preceding years. Thus, the rise in capital gains realizations by the wealthy occurred in spite of a deteriorating capital gains environment for most taxpayers. This strongly suggests that it was the rate reductions and not the market environment of 1982 which was at work.

Figure 7 presents the relationship between interest income and after tax shares. 1982 marked the high point in the emergence of low minimum balance money market accounts which offered competitive interest rates. The aggregate data suggested a trend to more equal distribution of this income as a result. This trend was not incorporated into the baseline. Extending this trend would have decreased the baseline estimate of interest income received by the higher income groups, implying a greater response of interest income and taxable income to the rate reduction of 1982. As modelled, interest income appears unresponsive to the rate reductions.

Figure 8 shows the relationship between itemized

CHART 3.6

RESPONSE OF INTEREST TO TAX RATE

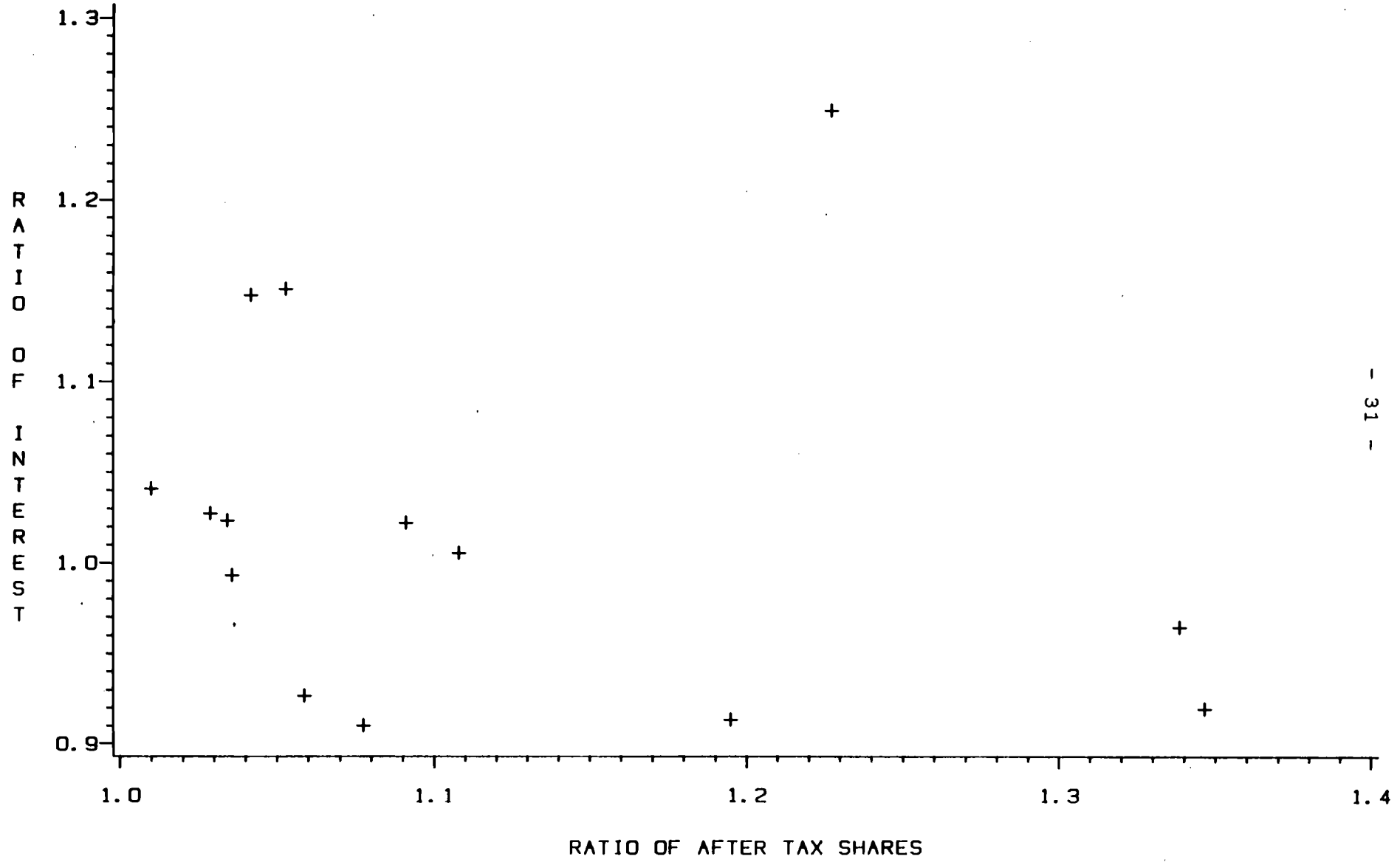
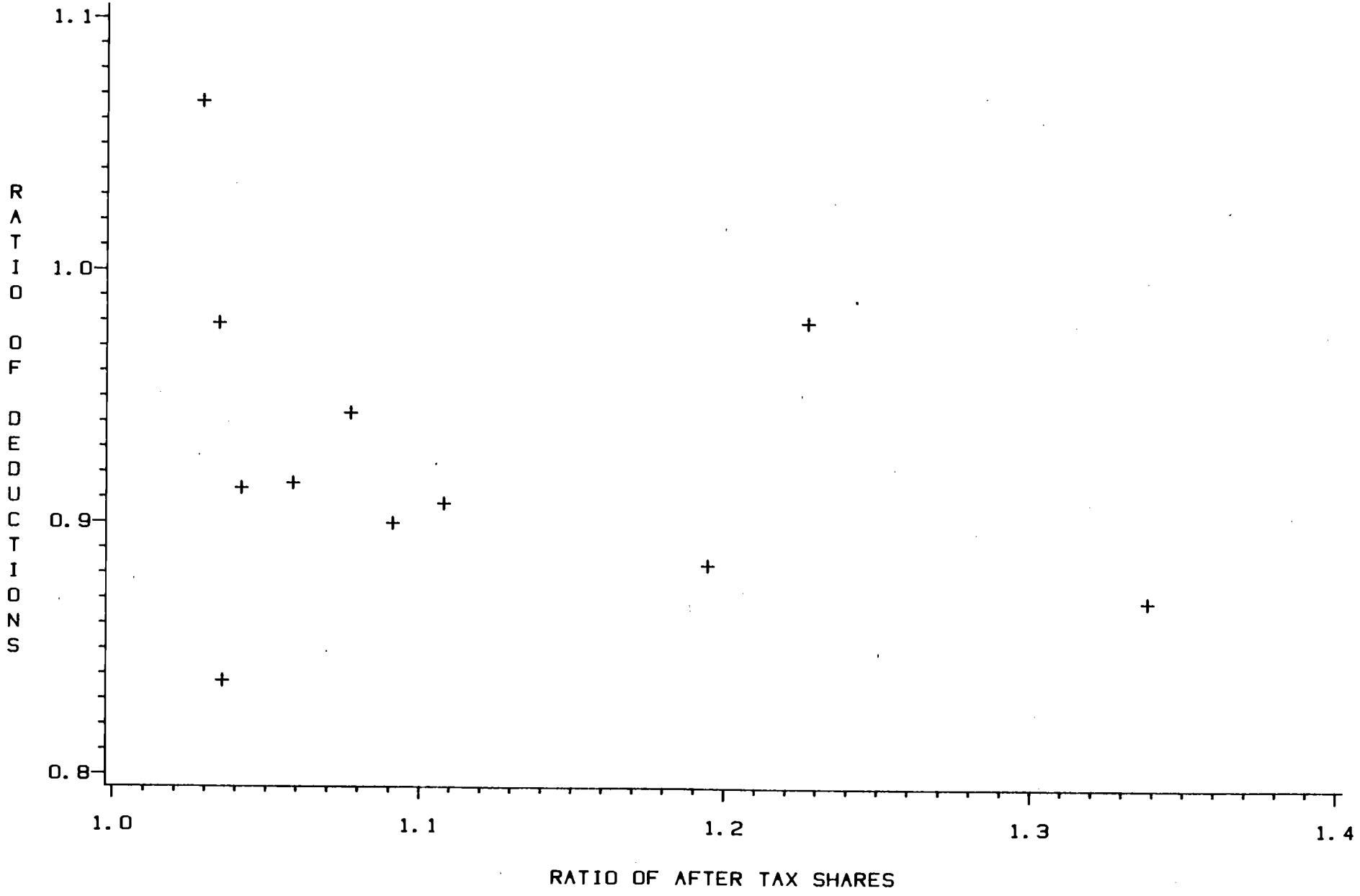


FIGURE 7

RESPONSE OF DEDUCTIONS TO TAX RATE



deductions and the price of taking those deductions. In nearly every case, the level of itemized deductions was below that predicted by the baseline. This would, of course, be a natural response to an increase in the price of deductions. Furthermore, there appears to be a greater depression of itemized deductions among those groups who saw the largest increase in price -- upper income groups.

Regression coefficients describing the relationships between the ratios of actual to baseline values for these income terms is presented in table 3. The table shows significant regression coefficients in the cases of taxable income, adjusted gross income, wages, capital gains, and business income. In each case, the coefficient of the regression respresents the elasticity of that type of income to the after-tax share the taxpayer keeps.

Two particular elasticities are striking: capital gains and business income. In the case of capital gains, the income term was defined as gains included in AGI, so 60 percent of long term gains were already excluded. Using the revenue maximization calculation discussed previously, the elasticity of 1.9 implies a revenue maximizing tax rate of 34 percent for gains included in AGI. This in turn implies a revenue maximizing capital gains tax rate of 14 percent.

These data suggest that types of income over which taxpayers have significant amounts of discretion -- wage and business income of upper income individuals and capital

TABLE 3

Parameter Estimates for Assorted Types of Income

Type of Income	Intercept	Elasticity to After-Tax Share	R^2
Taxable Income	-0.016 (0.036)	0.747 (0.224)	0.546
AGI	-0.024 (0.024)	0.652 (0.155)	0.662
Wages	-0.035 (0.044)	0.918 (0.282)	0.541
Capital Gains	-0.234 (0.084)	1.917 (0.529)	0.593
Business Income	-0.031 (0.058)	2.336 (0.365)	0.820
Interest	0.017 (0.053)	-0.117 (0.334)	0.013
Dividends	0.055 (0.105)	-0.406 (0.660)	0.040
Deductions	-0.070 (0.029)	-0.269 (0.186)	0.189

gains realizations -- have significantly higher degrees of behavioral response than income in general. Lower maximum marginal tax rates on wage and business income and a greater capital gains exclusion are indicated.

The data presented here suggest that there is no conflict between revenue needs and a further reduction of the top marginal personal income tax rate. However, certain questions remain open. For example, it is an open question whether this estimate of the revenue response for 1982 is an overestimate or an underestimate of the long run response one might expect from tax rate reduction. On the one hand, overestimation might be implied by a temporary unlocking of capital gains. On the other hand, it is likely that taxpayers learn avoidance behavior over time. Unless one assumes that portfolio and labor supply adjustments are sudden in response to changes in the tax environment, underestimation of the behavioral response by these data is implied.

Determination of the long run implications of these findings is complicated by the existence of future tax rate reductions built into the law for middle income taxpayers. Rates were scheduled to be 10 percent lower in 1983 than 1982, and 5 percent lower in 1984 than 1983 for all but the top income brackets. Thus any possible postponement of income and acceleration of deductions between 1981 and 1982 for high income taxpayers would imply similar behavior by middle income taxpayers between 1982 and 1983. The

argument that the implied revenue response in these data is exaggerated by temporary behavior must contend with the corollary of temporarily diminished revenue response in anticipation of future behavior.

FOOTNOTES

[1]Adam Smith, The Wealth of Nations (London: J.M. Dent and Sons, Ltd., 1776), 2:78.

[2]Jude Wanniski, "Taxes, Revenues, and the `Laffer Curve'," The Public Interest, Winter 1978, 4-5.

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

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

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

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

[7]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).

[8]Lawrence B. Lindsey, "Rate Reductions and Revenue Responses," National Bureau of Economic Research Working Paper, 1985.

[9]Emil Sunley, "The Maximum Tax on Earned Income," National Tax Journal, (December 1974): 543-552.

[10]Lawrence B. Lindsey, "Is the Maximum Tax On Earned Income Effective?" National Tax Journal (June 1981): 249-55.

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