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TAXES, HIGH-INCOME EXECUTIVES, AND THE PERILS OF REVENUE ESTIMATION IN THE NEW ECONOMY

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ABSTRACT

This paper attempts to help explain the unforecasted, "excess" personal income tax revenues of the last several years. Using panel data on executive compensation in the 1990s, it argues that because the gains on most stock options are treated as ordinary income for tax purposes, rising stock market valuations are directly tied to non-capital gains income. This blurred line between capital and wage income for has affected tax revenue in three ways, at least for these high-income people. First, stock performance has directly affected the amount of ordinary income that people report by influencing their stock option exercise decisions. Second, the presence of options gives executives more flexibility in changing the timing of their reported income and appears to make them much more sensitive to the short-run timing of tax changes, even accounting for the stock market changes of the period. Third, because of the tax rules on options, changing the capital gains tax rate, as the U.S. did in the late 1990s, can lead individuals to exercise their options early to convert the expected future gains into lower-taxed forms. The data show significant evidence of each of these effects and in all three cases, executives working in the 'new' economy and high-technology sectors, show decidedly greater responses.

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Recent years have been trying times for revenue estimators. Unexpectedly large tax revenues have pleased voters but created substantial uneasiness about whether the increases are temporary or if they are somehow the result of a permanently 'new' economy. There is a nagging sense that somehow the unprecedented boom in the stock market is responsible. Although rising stock values can explain major increases in capital gains tax revenue, the forecasts have also seriously understated ordinary income, as well, particularly at the top of the income distribution (for discussions of the literature on taxes and high-income people see Slemrod, 1998 or Goolsbee 1999, 2000a).

This paper argues that among high-income executives at least, there has been a noticeable blurring of the lines between capital and wage income from 1991 to 1998 and that this blurring is particularly pronounced in the high-technology sector as one might expect given the prevalence of stock options in those sectors or even from previous results on the tax sensitivity of high-tech demand (see Hausman, 1998; Goolsbee 2000b). This connects stock market gains with increase in ordinary income.

The data show three things about the relationship between ordinary income and capital income. First, as discussed in Huddart (1999) and Hall and Liebman (2000), rising stock prices lead to greater option exercise. While intuitive, because most stock option gains are treated as ordinary income, this creates a direct connection between stock market gains and ordinary income and the magnitude is large. Second, capital income is known to be especially sensitive to short-run and expected changes to tax policy (see Burman and Randolph, 1995). The data here update the work of Goolsbee (2000c) and show that because of the presence of options, ordinary income of executives was extremely sensitive to anticipated rate changes in the early 1990s, particularly for high-tech executives. Third, there is a direct connection between capital

gains tax rates and ordinary income. Falling capital gains rates in 1997 increased the probability of exercising options early to get future stock gains treated as capital gains, again especially for 'new' economy executives.

II. DATA ON EXECUTIVES

The primary data on executive compensation in this paper come from the EXECUCOMP database of Standard and Poor's. These data report the compensation of the five highest paid executives for all companies in the S & P 500 Index, the Mid-cap 400 index and the small-cap 600 index from 1991 to 1996 (data used later in the paper to account for changes in the capital gains tax rate provide further information on 1997 and 1998). More details on these data can be found in Goolsbee (2000c). I restrict the sample to executives at firms with a December fiscal year so as to match the tax year.

The firms are required to report on the compensation of their executives in numerous categories. Several of these categories are normally taxable as ordinary (wage and salary type) income including salary, bonus, long-term incentive plan payouts (a long-term bonus) and the value of stock options exercised. For the most common type of option (Non-Qualified), the difference between the exercise price and the strike price is treated as ordinary income at the time of exercise and deductible by the firm. Further appreciation in the stock is treated as capital gains. Two of the categories include income that is, in general, not taxable. These are the Black-Scholes value of options granted (data starts in 1992) and "other" income (primarily perquisites, and the like).

In 1996, the average compensation package for these executives was more than $1.2 million and taxable compensation was more than $1 million—clearly high income. Fortunately, because

the data are not restricted to CEOs and not restricted exclusively to large companies, there are numerous executives with high but not extraordinarily high incomes and this creates variation in the magnitude of the tax changes facing executives within individual years.

These data provide consistent information on a large number of high-income people over time but their major drawback is that they do not report the executive's total income, only their income coming from the firm. As a result, I will take reported taxable components of compensation as the individual's taxable income assuming a small amount of other income. To avoid endogeneity in determining the tax rates, I use a measure of permanent income to calculate the marginal rates following Goolsbee (2000c). To these data on compensation, I add information on the annual return on holding equity in the executive's company using the monthly return data from CRSP as well as total market value information given in EXECUCOMP.

III. STOCK RETURNS, INCOME TAX RATES, AND TAXABLE INCOME

The basic specification will explain the log of taxable income (i.e., sum of the taxable forms of compensation) as a function of the log of one minus the current and the future marginal tax rates, the log of one minus the corporate tax rate for firms in excess of the "deductibility cap" (see Goolsbee, 2000c for the definition), the log of real market value of the firm, and year dummies. The inclusion of year dummies means that the regressions are identified off of the cross-sectional change in tax rates within year (i.e., higher versus lower income executives). The specification for 1991 to 1996 is listed in column 1 of table 2.

Almost all of the variables are significant. As in Huddart (1999) and Hall and Liebman (2000), past returns have an important impact on reported ordinary income (no capital gains are included), as does market value. The magnitudes suggest that a one time firm return of .20

would increase ordinary income by 11.2 percent in the first year, growing to a total of 17.5 percent two years later and eventually settling down at 8 percent (because market value rose).

The increased income arising from option exercise, however, is simultaneously deducted by the firm, however, so the revenue impact is not as large as it appears. Using the estimated marginal tax rates for these firms from Graham and Lemmon (1998), the average corporate rate for these executives was .255. The revenue impact on ordinary income would, therefore, not be .396 times the increase in income but rather the difference between .396 and the corporate rate (i.e., .141) times the increase in income. Even still, given the market performance of the last few years, this is a potentially rather dramatic link between stock performance and ordinary income.

The results in column 1 also confirm that there is an intense short-run sensitivity to tax changes. The tax increases under Clinton were expected in advance and executives appear to have responded in anticipation. The short-run elasticity of income is about one but the non-transitory (sum of the two coefficients) is close to zero and not significant. Hall and Liebman (2000) show that in their sample (from 1990 to 1994 and exclusively drawn from CEOs of fortune 500 companies), including past stock returns eliminates the evidence of short-run timing shifts but this is not true in this larger data set which supports the results in Goolsbee (2000c).

Column 2 shows that the short run sensitivity to marginal rates comes exclusively from stock options. The dependent variable in this column is taxable income excluding options exercised and there is almost no role for tax policy (and past returns have much smaller effects, too).

Next, I examine whether new economy executives behave differently than others, comparing high-technology industries (aerospace, biotechnology, communications equipment, cellular and telephone companies, computer equipment, software and services, electronics, and photography and imaging) with all others. The average compensation in the two sectors was approximately

equal ($1.3 million for high-tech, $1.2 million for others in 1996) but with a greater emphasis on stock options. The results in columns 3 and 4 show marked differences between the two industry types. The short run elasticity of income with respect to the net of tax share for high-tech executives exceeds 3.5(!). The short run elasticity for the old economy executives is closer to .8. The non-transitory impacts are not significantly different from zero in either regression.

IV. CAPITAL GAINS RATES AND ORDINARY INCOME

The final impact of blurring lines between ordinary and capital income is that it potentially creates a link between capital gains rates and reported ordinary income. If true, part of the unexpected revenue in 1997 and 1998 may arise from the capital gains rate reductions beginning in 1997. As Huddart (1999) shows, if capital gains rates fall while personal rates remain constant, some executives will have an incentive to exercise their stock options early in order to get future stock price accumulations taxed at the more favorable capital gains rate rather than at the personal rate. His model can be solved to show that an executive will exercise early whenever

$$r < \frac{(\tau - \tau_{cg})\hat{R}}{\tau + \frac{P_X}{P_0}(1-\tau)}$$

where $\hat{R}$ is the expected future appreciation rate if the stock, r is the individual's borrowing cost, τ is the personal tax rate, τ_{cg} is the capital gains rate, P_X is the exercise price and P_0 is the strike price (this rule ignores the deduction available to the firm from the option exercise). If $\hat{R}$ >0, the derivative of the right hand side is negative and is decreasing in the expected future gain (i.e., cutting the capital gains rate raises the r.h.s. and makes early exercise more likely and this effect is greater the larger is the expected future gain).

Preliminary evidence on the subject using the updated EXECUCOMP data from 1997 and 1998 suggest that this cross-impact of capital gains rates on ordinary income may have been important. The capital gains tax rate for these executives fell from 28 percent to 20 percent in 1997. Column 1 of Table 4 reports the results from a linear probability that the executive exercises options in the given year as a function of current, past and future stock returns, one minus the capital gains tax rate, this capital gains rate term interacted with stock returns in the subsequent year (implicitly assuming that high-level executives had accurate expectations of future returns), a time trend, a dummy indicating whether the executive exercised stock options in the previous year, and individual dummies for all executives that received any stock options in the period (1992 to 1998). There is no cross-sectional variation in the capital gains tax rate so the regression does not include year dummies. The results indicate that executives were significantly more likely to exercise options when the capital gains tax rate fell and significantly more so for those working at firms with larger future appreciations.

Column 2 adds year dummies. This eliminates the capital gains tax rate term on its own but the interaction term remains identified and is still significant and very close to its previous value. Moving from a capital gains rate of .28 to .20 in 1997 increases the probability of exercise for an executive working at a firm with the mean annual log return (return of .169) by 5 percent from .37 to about .39. For an executive at a firm with returns one standard deviation higher (return of .526), the probability rises by about 15 percent from .37 to almost .43.

Columns 3 and 4 divide up the sample into high-tech executives (column 3) and others (column 4). Here again, the new economy executives seem to respond much more to tax changes than do the old economy executives. The coefficient on the capital gains interaction term indicates that capital gains rates have almost double the impact in the high-tech sector. This

cross-tax effect of capital gains on ordinary income has not been examined in previous work and may be important for understanding the estimated responses of income to tax changes such as the Tax Reform Act of 1986 where many policies changed simultaneously (see Auerbach and Slemrod, 1998).

V. CONCLUSION

The rise of stock options and their prevalence in high-technology industries mean that recent years have blurred the line between capital and wage income. For executives in the 1990s, high stock returns lead to significant increases in ordinary income through high option exercise and bonuses. The presence of options also made executives particularly sensitive to expectations about future tax changes, especially in high-tech industries. Changing capital gains tax rates also appear to have had direct effects on ordinary income. The growing importance of options in the economy and the rising role of high-technology industries mean that the blurring of wage and capital income is likely to continue to complicate revenue estimation in the years to come.

Table 1: Explaining Taxable Income

	(1) All	(2) No Options	(3) High-Tech	(4) Low-Tech
Ln $(1-\tau)_t$	1.042	-.331	3.531	.859
	(.321)	(.211)	(1.739)	(.307)
Ln $(1-\tau)_{t+1}$	-.963	.136	-5.307	-.615
	(.449)	(.319)	(1.938)	(.460)
Ln $(1-\tau_c)$ x [Deduct.]	.228	.188	-.279	.242
	(.156)	(.106)	(.313)	(.163)
Ln $(\text{Mkt value})_t$	.403	.206	.523	.371
	(.021)	(.013)	(.054)	(.023)
Ln $(\text{Return})_t$	.162	.096	.199	.152
	(.022)	(.012)	(.057)	(.023)
Ln $(\text{Return})_{t-1}$	.205	.047	.219	.202
	(.019)	(.010)	(.051)	(.020)
Ln $(\text{Return})_{t-2}$	.103	.039	.077	.110
	(.016)	(.008)	(.044)	(.017)
High-Income trend	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Indiv. Dummies	Yes	Yes	Yes	Yes
N	14832	15253	1614	13218
R^2	.83	.90	.78	.83

Notes: Standard errors in parentheses. The sample is 1991 to 1996. The dependent variable is taxable income in (1), (3) and (4) and taxable income minus options exercised in column (2). The subscript indicates the year of the variable. The personal tax rate is τ, [Deduct.] is an indicator variable for non-deductibility of the executive's pay and τ_c is the corporate tax rate. All the equations include year and individual dummies and a separate income trend for people with permanent income greater than $275,000.

Table 2: Probability of Option Exercise

	(1) All	(2) All	(3) High-tech	(4) Low-Tech
$\text{Ln}\ (1-\tau_{cg})_t$	.155			
	(.138)			
$\text{Ln}\ (1-\tau_{cg})_t \times \text{Ln}(\text{Return})_{t+1}$	.985	.944	2.236	.825
	(.270)	(.271)	(.661)	(.324)
$\text{Ln}\ (\text{Return})_{t+1}$	.253	.246	.656	.198
	(.080)	(.080)	(.196)	(.095)
$\text{Ln}\ (\text{Return})_t$	.144	.139	.071	.141
	(.016)	(.017)	(.041)	(.021)
$\text{Ln}\ (\text{Return})_{t-1}$	.181	.182	.165	.183
	(.015)	(.016)	(.041)	(.019)
$\text{Ln}\ (\text{Return})_{t-2}$	.092	.090	.046	.096
	(.013)	(.013)	(.034)	(.016)
$(\text{Exercise Dum.})_{t-1}$	-.179	-.179	-.164	-.179
	(.012)	(.012)	(.040)	(.013)
Time trend	Yes	No	No	No
Year Dummies	No	Yes	Yes	Yes
Indiv. Dummies	Yes	Yes	Yes	Yes
N	15017	15017	1414	12350
R^2	.59	.59	.58	.59

Notes: The dependent variable is a {0,1} of whether the executive exercises options in the given year. Standard errors are in parentheses. The sample period is 1992 to 1997. The exercise dummy is a one if the executive exercised options in the previous year.

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