RESPONSES OF THE SELF-EMPLOYED TO THE 2001 TAX ACT*

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THE ECONOMIC GROWTH AND TAX RELIEF Reconciliation Act of 2001 (EGTRRA) lowered taxes for most taxpayers. Gale and Potter (2002) estimated that the average federal tax rate would fall from 26.3 percent to 24.1 percent, and that the largest tax cuts would be experienced by those at the top of the income distribution. Some changes originally scheduled to be phased in over a number of years were accelerated by the Jobs and Growth Tax Relief Reconciliation Act of 2003. Upon signing the bill on May 28, 2003, President Bush stated, "Today we are taking essential action to strengthen the American economy... We're helping small business owners looking to grow and to create more new jobs." In this paper I use a panel of tax return data from 1999 to 2003 to investigate how the business decisions of self-employed taxpayers responded to these tax cuts. I find no evidence that the self-employed responded by hiring more workers or by expanding the size of their businesses, as measured by gross receipts.

My findings differ from those in a line of research by Carroll, Holtz-Eakin, Rider, and Rosen (2000a, 2000b, 2001). They study responses of the self-employed to the substantial tax cuts of 1986. They find that the self-employed taxpayers who experienced the largest tax cuts were more likely to hire new employees, to make new investments in their businesses, and to experience growth in business receipts. Why are responses of the self-employed to the 2001 tax cuts so different from the responses of the self-employed to the 1986 tax cuts? While differences in macroeconomic conditions and in the characteristics of the self-employed likely play a role, the most compelling explanation is the very different nature of the 1986 and 2001 tax cuts. The 2001 tax cuts were smaller and more equally distributed across the income distribution. It may be only the highest-income self-employed taxpayers who respond to rate cuts by expanding their businesses.

PREVIOUS RESEARCH

There is a long-standing view that self-employed individuals account for a disproportionately large share of new job creation. Certainly self-employment is a nontrivial component of the U.S. economy. Hipple (2004) uses CPS data to show that 10.3 million individuals, roughly 7.5 percent of all workers, were self-employed in 2003. Another 4.9 million owned and worked in an incorporated business. These individuals are categorized as wage and salary workers in the CPS, but could reasonably be counted as self-employed. Birch (1987) argues that firms with fewer than 20 employees accounted for 82 percent of new job creation between 1981 and 1985. Davis, Haltiwanger, and Schuh (1996) show that small firms do have high rates of gross job creation, but simultaneously high rates of job destruction.

While there is a great deal of research investigating how taxes affect an individual's decision to enter into self-employment, recently summarized by Schuetze and Bruce (2004), there is considerably less research on how taxes affect the business decisions made by those who are already self-employed. The major work in this area is a series of papers by Carroll, Holtz-Eakin, Rider, and Rosen (2000a, 2000b, 2001), showing that the tax cuts of 1986 led self-employed taxpayers to expand their businesses substantially. They use a panel of tax returns from 1985 and 1988, constructed by the U.S. Department of the Treasury. They compare the behavior of those initially in high tax brackets, who experienced large declines in marginal tax rates, to the behavior of those initially in lower tax brackets, who experienced little change in marginal tax rates. In Carroll et al. (2000a), they show that a 10 percent increase in a filer's tax price (1 minus the marginal tax rate) is associated with a 12 percent increase in the probability of hiring any workers and with a 3.7 percent increase in the total wages paid. In Carroll et al. (2000b), they use information on depreciation deductions to impute capital investments. They show that a 5 percentage point

*This paper uses data generously made available to me by the staff of the Joint Committee on Taxation. The views presented are those of the author and should not be attributed to the staff of the Joint Committee or to any member of Congress. I have benefited from the comments and assistance of many JCT staff members, and of my discussant, Kate Harper. I owe particular thanks to Jim Cilke for constructing the tax calculator used here.

increase in marginal tax rates would reduce average capital investment by 9.9 percent. In Carroll et al. (2001), they find that a 10 percent increase in tax price is associated with an 8.4 percent increase in Schedule C gross receipts.

Other closely related work investigates how taxes affect the longevity of businesses owned by the self-employed. Bruce (2002) uses data from the Panel Study of Income Dynamics to study transitions out of self-employment. Surprisingly, he finds that higher marginal tax rates on self-employment income are associated with lower probability of exit from self-employment. Gurley-Calvez and Bruce (2008) use a panel of tax return data spanning 1979 to 1990. They find that an increase in the tax rate on self-employment income shortens spells of self-employment activity, while an increase in the tax rate on wage income lengthens self-employment spells. They speculate that the net effect of the 1986 tax cuts was to lengthen self-employment spells.

The income and expenses reported to the IRS by self-employed taxpayers may be particularly sensitive to changes in tax rates because of the relative ease of misreporting. A misreported value of wage income is very likely to be discovered by the IRS, thanks to third-party information returns (W-2 forms submitted by employers to the IRS). A misreported value of self-employment income is much less likely to be discovered. It is possible that the tax rate cuts of 2001 encouraged greater compliance in the reporting of self-employment income, although theoretical predictions about the relationship between the tax rate and compliance are ambiguous.

DATA AND METHODOLOGY

The JCT Tax Panel

I use a 5-year panel of tax return data, beginning in tax year 1999. This data set is maintained by the Joint Committee on Taxation. I was generously granted access to the data as a temporary employee of the JCT. The data set includes most of the items reported on the federal tax return and supporting schedules. Data are matched to Social Security records to provide some basic demographic information, such as date of birth. High-income returns are sampled at a higher rate than low-income returns. Throughout my analysis, I use weights designed to represent the 1999 population of tax filers. I restrict attention to filing units with no change in filing status over the length of the panel. Thus, individuals who marry or divorce between 1999 and 2003 are eliminated from my sample. I also eliminate returns filed by dependents, and returns on which the primary filer is either under age 25 or over age 55 in 1999, in order to focus on those in their prime earning years.

The panel includes 82,335 tax-filing units in 1999, with 60,235 observed in all five years.[1] Weighted means for the panel are shown in Table 1, with panel A reflecting all returns present in a given year and panel B restricted to returns present in all five years. Dollar figures are in nominal terms. The increase in AGI over time in the unbalanced panel reflects the fact that attrition out of the panel is lower for high-income filers. Marginal tax rates for each filing unit were computed using a JCT calculator that incorporates the Earned Income Tax Credit, the Alternative Minimum Tax, the child tax

Table 1
Weighted Means

Year	*AGI*	*Marginal Tax Rate*	*Percent with Schedule C*
A. Unbalanced Panel			
1999	46160	15.9	13.7
2000	52248	17.2	14.6
2001	51678	17.0	15.0
2002	52269	15.8	15.5
2003	54238	14.7	16.1
B. Balanced Panel			
1999	54106	17.7	15.1
2000	58422	18.5	15.6
2001	56173	18.1	15.7
2002	55590	16.7	15.9
2003	56411	15.2	16.5

credit, and phaseouts of various provisions. The phased-in provisions of EGTRRA are reflected by the decline in marginal tax rates between 2001 and 2002, and again between 2002 and 2003.

Throughout this paper, I define self-employment as filing a Schedule C. Table 1 shows that in any year of the panel, around 15 percent of returns include a Schedule C. Among those who appear in all five years of the panel, 25.2 percent file a Schedule C in at least one year. Why is this figure higher than self-employment rates derived from survey data? First, self-employment is measured differently in surveys and in tax return data. The definition of self-employment used by the CPS and other surveys depends on an individual's primary activity. In my tax return data, the definition of self-employment captures all returns that file a Schedule C, even if Schedule C income is small relative to wage and salary income. In each year of the panel, the share of Schedule C returns that also report wage and salary income is about 72 percent. Among returns with both Schedule C and wage and salary income, about half have net Schedule C income of less than $1000. An individual with less than $1000 of annual self-employment income is unlikely to classify himself as primarily self-employed in the CPS. Second, my data is at the level of the tax-filing unit rather than the individual. A tax-filing unit is classified as self-employed if anyone within the unit files a Schedule C. Both panels of Table 1 suggest an increase over time in the rate of self-employment. The larger increase in the unbalanced panel likely reflects the fact that filing a Schedule C is positively correlated with income[2] and attrition from the panel is lower for high-income filing units.

Both income and expenses associated with self-employment are reported on Schedule C. In particular, the total amount of wages paid to employees is reported. This allows me to determine which self-employed taxpayers are also functioning as employers. In each year of the panel, approximately 8 percent of Schedule C filers report non-zero wage expenses. Table 2 compares descriptive statistics for 1999 Schedule C filers with zero and non-zero wage expenses. Not surprisingly, those who hire employees own larger and somewhat older businesses. The mean 1999 net Schedule C income for those hiring employees is approximately $39,000 relative to just over $1000 for those not hiring employees. Slightly more than 5 percent of those hiring employees are filing a Schedule C for the first time, while approximately 10 percent of those not hiring employees are first-time Schedule C filers. Comparisons for later tax years show similar patterns.

Empirical Strategy

I consider the effects of the 2001 tax rate reductions on three outcomes: whether a self-employed individual reports any wage expenses (as a proxy for whether she hires any workers), the amount of wage expenses paid, and the amount of Schedule C gross receipts. To investigate how the decision to hire any workers is affected by taxes, I estimate the following equation, using only the set of returns reporting Schedule C income in both 1999 and 2003:

$$\textbf{(1)} \quad Hired_{2003} = \beta_0 + \beta_1 \cdot Hired_{1999} + \beta_2 \cdot \Delta \ln(Taxprice) + \gamma \cdot X + \delta \cdot Industry + \varepsilon.$$

By restricting my sample to filing units with Schedule C income in both years, I avoid the possibility that tax-induced entry into or exit from self-employment is biasing my results. The dependent variable is a dummy equal to 1 if any wage expenses are reported on the 2003 Schedule C. Because there is substantial persistence in the decision to hire, I include on the right-hand side an indicator for paying any wage expenses in 1999. The key explanatory variable is defined as

$$\textbf{(2)} \quad \Delta \ln(Taxprice) = \ln(1 - MTR_{2003}) - \ln(1 - MTR_{1999}).$$

Table 2
Comparison of Schedule C Filers by Presence of Wage Expense, Tax Year 1999

	No Wage Expense	*Wage Expense*
Mean Gross Schedule C Income	21,874	153,681
Mean Net Schedule C Income	1,159	38,614
Mean AGI	61,676	75,609
% Filing First Schedule C	10.2	5.5
Mean Age of Primary Filer	45.6	47.9

If, in fact, reductions in tax rates (increases in tax price) induce some self-employed individuals to begin hiring labor, the coefficient on Δ ln (*Taxprice*) will be positive. The vector of demographic characteristics *X* includes the age of the primary taxpayer in 1999, age squared, an indicator for filing a joint return, and an indicator for claiming dependents in 1999. The vector *Industry* includes dummies for manufacturing, trade and transport, finance and professional, and services. Because the dependent variable is binary, I use probit estimation. This specification closely matches that of Carroll et al. (2000a).

An individual's marginal tax rate is, of course, a function of his income. If income and the decision to hire labor are correlated, then values of Δ ln (*Taxprice*) are not exogenous.

The standard way to address this problem in a panel spanning a statutory tax change is to instrument for the tax change. To construct the instrument, I predict values of MTR_{2003} by applying 2003 tax law to 1999 income. That is, I compute the tax rate that would be faced by an individual in 2003 if his behavior in that year was identical to his behavior in 1999. Substituting this predicted value of MTR_{2003} into the definition of Δ ln (*Taxprice*) results in a variable that is independent of changes in income. Essentially I am using only that part of the variation in tax price that comes from changes in the tax law.

Next, I investigate whether, among those who have already made the decision to hire labor, tax cuts are associated with increased use of hired labor. I restrict my sample to those who report non-zero wage expenses in both 1999 and 2003, and use the dependent variable:

$$\textbf{(3)} \quad \Delta \ln(WageExpenses) = \ln(WageExpenses_{2003}) - \ln(WageExpenses_{1999}).$$

I use almost the same set of explanatory variables as before, without the indicator for hiring in 1999. If the 2001 tax cuts led to expansions of self-employment enterprises, either through the hiring of additional workers or through increasing the hours worked by current employees, the coefficient on the tax price variable will be positive.

Finally, I look at the effect of tax cuts on Schedule C gross receipts:

$$\textbf{(4)} \quad \Delta \ln(GrossReceipts) = \ln(GrossReceipts_{2003}) - \ln(GrossReceipts_{1999}).$$

With this as the dependent variable, all returns with non-zero gross Schedule C receipts in both 1999 and 2003 are included in the regression. As before, the coefficient on the tax price variable will be positive if the 2001 tax cuts generated expansions in the businesses owned by the self-employed.

RESULTS

The results of probit estimation of the hiring equation are shown in Table 3, with standard errors in parentheses. In all cases, the dependent variable is a dummy equal to 1 if there are any wage expenses reported on the 2003 Schedule C. All specifications instrument for the tax change. The first column shows the most basic specification, while the second column adds demographic and industry controls.

Neither column 1 nor column 2 provides any evidence that tax changes have an impact on the decision to hire labor. The coefficients on the tax variable are small and not significantly different from zero. Other controls affect the decision to hire in predictable ways. In both specifications, there is evidence of substantial persistence in the decision to hire labor. The coefficient on having hired in the base year is large and highly significant. Column 2 shows that joint filers and those with dependents are more likely to hire labor, while the age of the primary filer has no significant effect on the hiring decision. There is no evidence that the propensity to hire differs significantly with industry.

The lack of a significant response to tax changes that I find is in sharp contrast to the results of Carroll et al. (2000a). Although my specification is intentionally very similar to theirs, one difference is that they estimate unweighted regressions. I have chosen to use 1999 sampling weights in order to compute results representative of the 1999 tax-filing population. These weights will not be appropriate if the relevant population here is all Schedule C filers, as opposed to all filers. Evidence from both my data and from a variety of other sources shows that Schedule C filers are not a random sample of the population. In particular, Schedule C filers have higher incomes than other filers. In column 3, I reestimate without weights. Here the coefficient on the tax variable suggests a larger hiring response, closer to the result of Carroll et al., but the coefficient still is not different from zero at conventional levels of significance.

Table 3
Hiring Regression Results

	Base Year = 1999			*Base Year = 2001*	
	Weights		*No Weights*	*Weights*	*No Weights*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
$Hired_{1999}$	1.941	1.977	2.235	2.468	2.629
	(0.077)	(0.078)	(0.055)	(0.080)	(0.059)
Δ ln (taxprice)	0.464	0.302	0.625	0.172	0.860
	(0.679)	(0.690)	(0.403)	(0.755)	(0.472)
Joint		0.193	0.219	0.253	0.197
		(0.092)	(0.073)	(0.095)	(0.075)
Any Deps in 1999		0.228	0.150	0.175	0.168
		(0.086)	(0.062)	(0.088)	(0.064)
Age		-0.022	0.010	-0.019	0.005
		(0.048)	(0.037)	(0.047)	(0.037)
Age Squared		0.0002	-0.0001	0.0002	-0.00004
		(0.0006)	(0.0004)	(0.0006)	(0.0004)
Manufacturing		-0.479	-0.270	-0.478	-0.344
		(0.325)	(0.224)	(0.377)	(0.239)
Trade, Transport		-0.103	0.074	0.014	0.031
		(0.120)	(0.096)	(0.131)	(0.091)
Finance, Professional		-0.029	0.050	0.073	0.064
		(0.113)	(0.084)	(0.122)	(0.071)
Services		-0.099	0.021	-0.077	0.042
		(0.106)	(0.082)	(0.116)	(0.069)
Constant	-1.709	-1.356	-2.186	-1.720	-2.262
	(0.044)	(0.953)	(0.771)	(0.950)	(0.767)
N	5286	5286	5286	6181	6181

Note: Standard errors are in parentheses.

Although my panel begins in 1999, the change in taxes due to EGTRRA actually occurs between 2001 and the end of the panel. This suggests that it may be more appropriate to use 2001 as the base year. Columns 4 and 5 repeat the hiring regression for returns that report Schedule C income in 2001 and 2003. Here, the weighted regression offers no evidence that tax changes are associated with hiring decisions. In the unweighted regression, the coefficient on the tax variable is positive and significant at the 10 percent level. This is the only specification in Table 3 that suggests a reduction in the marginal tax rate (and hence an increase in the tax price) is associated with an increase in the propensity to hire labor.

Although the 2001 tax cuts appear not to have increased the propensity for Schedule C filers to hire employees, they may have influenced hiring decisions on the intensive margin. Table 4 shows results for weighted regressions in which the dependent variable is the change in the natural log of wage expense reported on Schedule C, where the sample is restricted to those with non-zero wage expenses. All specifications instrument for the tax change. The first column shows the most parsimonious specification, the second column adds a full set of controls, and the third column uses the richer specification with 2001 as the base year. The coefficient on the tax price variable is insignificant in all three cases. Although not shown in Table 4, unweighted regression results look similar. I find no evidence that the 2001 tax cuts increased wage expenses paid by the self-employed to their employees.

Table 4
Wage Expense Regression Results

	Base Year = 1999		*Base Year = 2001*
	(1)	*(2)*	*(3)*
Δ ln (taxprice)	0.708	0.459	-0.777
	(0.930)	(0.901)	(0.931)
Joint		0.247	0.166
		(0.205)	(0.174)
Any Deps in 1999		-0.012	-0.169
		(0.176)	(0.132)
Age		0.140	-0.106
		(0.111)	(0.081)
Age Squared		-0.002	0.001
		(0.001)	(0.001)
Manufacturing		-0.366	-0.753
		(0.367)	(0.320)
Trade, Transport		0.010	0.150
		(0.294)	(0.236)
Finance, Professional		0.148	0.115
		(0.285)	(0.247)
Services		0.191	0.327
		(0.275)	(0.240)
Constant	0.167	-3.126	2.301
	(0.091)	(2.309)	(1.618)
N	746	746	879

Note: Standard errors are in parentheses.

In Table 5 the dependent variable is the change in the natural log of Schedule C gross receipts. All filing units with non-zero Schedule C gross receipts in both 1999 and 2003 are included in the sample. This allows me to look for evidence of expansions within a broader set of self-employment enterprises than the set included in the wage regressions. With 1999 as the base year, there is no evidence of an effect of tax changes on gross receipts. With 2001 as the base year, reductions in marginal tax rates (increases in tax prices) are actually associated with declines in gross receipts.

DISCUSSION

My results show no evidence that the tax cuts of 2001 were associated with increases in hiring or in business receipts among the self-employed. How can these results be reconciled with earlier estimates documenting a substantial expansionary impact of tax cuts on entrepreneurs? One possibility is that self-employed business owners were reluctant to expand in 2001 because macroeconomic conditions were less favorable than in 1986. According to the NBER, the economy was in recession from March 2001 until November 2001. The unemployment rate was lower in 2001 than in 1986, but was rising rather than falling. From 1985 until 1988, the period covered by the Carroll et al. (2000a, 2000b, 2001) studies, the unemployment rate fell from 7.2 percent to 5.5 percent. From 1999 to 2003, the unemployment rate rose from 4.2 percent to 6.0 percent.

A second possibility has to do with business owners' choices among a number of organizational forms. I look only at sole proprietors, those who file a Schedule C, as do Carroll et al. (2000a, 2000b, 2001) An alternative option, much more common now than in 1986, is to organize as an S corporation. Sole proprietors bear full liability for any business losses, while owners of S corporations have limited liability. Like a sole proprietorship,

Table 5
Gross Receipts Regression Results

	Base Year = 1999		*Base Year = 2001*
	(1)	*(2)*	*(3)*
Δ ln (taxprice)	0.235	0.489	-1.056
	(0.489)	(0.492)	(0.432)
Joint		0.007	0.031
		(0.056)	(0.041)
Any Deps in 1999		-0.002	-0.002
		(0.056)	(0.040)
Age		-0.071	-0.029
		(0.033)	(0.025)
Age Squared		0.001	0.0002
		(0.0004)	(0.0003)
Manufacturing		-0.176	-0.476
		(0.267)	(0.166)
Trade, Transport		-0.059	0.017
		(0.084)	(0.065)
Finance, Professional		0.019	0.069
		(0.078)	(0.061)
Services		0.029	0.060
		(0.067)	(0.052)
Constant	0.123	2.065	0.854
	(0.031)	(0.665)	(0.495)
N	4800	4800	5611

Note: Standard errors are in parentheses.

an S corporation is not a taxable entity. Instead, the business owner reports and pays taxes on the income of the business. If growing businesses are now converted to S corporations, while stagnant businesses remain sole proprietorships, those who own the most successful businesses will drop out of my sample. This type of sample selection will bias my results against finding expansionary responses to tax cuts. There is some evidence that this occurs. Among all cases in which I observe a Schedule C in two adjacent years, the average amount of gross Schedule C receipts in the first year is approximately $74,000. Among cases in which a Schedule C is filed in one year but not the next, and S corporation income is reported in the second year, the average gross Schedule C receipts in the first year is approximately $82,000.

A third, and very likely, explanation for the different responses to the 1986 and 2001 tax cuts is that the tax cuts themselves differed in important ways. In 1986, the reductions in marginal tax rates were much larger, particularly for high-income groups. The top statutory rate was reduced from 50 percent to 38.5 percent. In 2001, the top rate was reduced from 39.6 percent to 39.1 percent immediately, with phased-in reductions to 35 percent by 2006. This phased-in change may have been less visible to taxpayers, hence prompting a smaller response.

Notes

[1] I compare weighted sums from the panel to population totals in Campbell and Parisi (2002) and Parisi and Hollenbeck (2004, 2005). By design, the weighted 1999 figures match the population totals. Due to attrition from the panel and changes in the population, the panel becomes less representative of the population in each subsequent tax year. By 2003, the panel accounts for 71 percent of all returns filed, 77 percent of returns reporting business income or loss, and 80 percent of net business income.

[2] The mean 1999 AGI for returns with Schedule C is $62,914, while the mean for returns without Schedule C is $43,509.

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