

# **Health Insurance Deductibility and Entrepreneurial Survival**

by

**Tami Gurley-Calvez  
Alexandria, VA 22314**

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## *Executive Summary*

This analysis uses a panel of tax return data (1988-1990) to examine whether the differential tax treatment of health insurance premiums for entrepreneurs and wage and salary workers affects entrepreneurial activity. Specifically, the author examines the effects of health insurance deductibility on the probability of entrepreneurial exit. Prior empirical literature has mainly focused on the effects of tax rates and generally concludes that taxes matter in entrepreneurial decisions. However, these studies focus almost exclusively on tax rates. The current analysis expands this growing literature by investigating whether or not additional aspects of the tax system are likely to generate behavioral responses.

Health insurance premiums have historically received different tax treatment depending on employment sector. Premiums paid by employers on behalf of employees are generally deductible in calculating both income and payroll taxes. Conversely, the self-employed were not able to deduct health insurance premiums when calculating income tax or payroll tax liabilities prior to 1987. In calculating income taxes, a self-employed health insurance deduction was implemented in 1987 and made permanent ten years later. The deduction was incrementally increased until self-employed health insurance premiums were made fully deductible in the calculation of income taxes in 2003. However, this did not equalize the tax treatment of health insurance premiums as self-employed health insurance premiums are still not deductible in payroll tax calculations.

The results of the current analysis offer compelling evidence that health insurance deductibility enhances entrepreneurial survival. The presence of a health insurance deduction decreases the probability of exit by 2.65 percentage points for single filers. For married filers, the presence of a health insurance deduction reduces the probability of exit by 10.52 percentage points.

Further, the results suggest that modest increases in the dollar value of the health insurance deduction can also be used to achieve similar reductions in the probability of exit. These effects suggest that the 2003 increase in the deduction (from 75 percent to 100 percent) likely enhanced survival. In addition, the results suggest that decreases in the probability of entrepreneurial exit are an important consideration when evaluating policies to allow a health insurance deduction in calculating payroll tax liabilities.

## *1. Introduction<sup>1</sup>*

Health insurance premiums paid by employers on behalf of employees have historically received different tax treatment than premiums paid by the self-employed for themselves and their dependents. Health insurance premiums paid by employers are generally deductible in calculating both income and payroll taxes for wage and salary workers.<sup>2</sup> Additionally, other tax provisions such as flexible spending accounts allow employees to pay their share of premiums and medical expenses out of pre-tax dollars.<sup>3</sup>

However, self-employed health insurance premiums were not deductible when calculating income tax or payroll tax liabilities prior to 1987. A modest move toward equalization of the income tax treatment occurred in 1987 with the implementation of a self-employed health insurance deduction of 25 percent. The deduction was made permanent ten years later and incrementally increased until self-employed health insurance premiums were made fully deductible in the calculation of income taxes in 2003.<sup>4</sup> However, this did not equalize the tax treatment of health insurance premiums as self-employed health insurance premiums are still not deductible in payroll tax calculations.

A short panel of tax return data (1988-1990) is used to examine whether the

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<sup>2</sup> See Internal Revenue Code 16 U.S.C. Sec.162(l) (Internal Revenue Code of 1986).

<sup>3</sup> It is estimated that the tax expenditure is at least \$120 billion for employer-based health insurance tax-incentives (Burman et al., 2003).

<sup>4</sup> See Internal Revenue Code 16 U.S.C. Sec.162(l) (1)(B).

differential tax treatment of health insurance premiums for entrepreneurs and wage and salary workers affects decisions of current entrepreneurs to remain in an entrepreneurial activity. This study is the first to examine the effects of health insurance deductibility on the probability of entrepreneurial exit. The survival of entrepreneurial activities is a valuable research question in part because entrepreneurs are thought to drive economic growth by creating jobs and producing innovations.

Treating health insurance premiums differently under the tax system might induce individuals to alter their behavior toward the tax-favored activity. From an economic perspective, this creates a distortion from the efficient allocation of resources that would have been achieved absent the tax code. From a policy perspective, the presence of behavioral responses creates the opportunity to use the tax system as a policy tool to alter the levels of different activities in the economy. This may be desirable to offset negative externalities (consequences of economic activity that affect other people but are not taken into account by the decision-maker) or to achieve other policy goals such as equity or simplicity.

The topic of health insurance is timely from a policy perspective as rising health care expenditures and an increase in the number of uninsured persons have drawn national attention to the health care debate. Bills introduced in both the House and Senate during the 108th Congress sought to make self-employed insurance premiums deductible in calculating payroll taxes.<sup>5</sup> The policy debate has dealt more broadly with the health insurance issue by focusing on tax-exempt health savings accounts. The effects of tax incentives on entrepreneurial survival might be particularly relevant for

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<sup>5</sup> The house bill was titled the Self-Employed Health Care Affordability Act of 2003 (H.R. 1873, referred to House Ways and Means Committee 4/30/2003) and the companion Senate bill was titled the Equity for Our Nation's Self-Employed Act of 2004 (S. 2433, referred to Senate Finance Committee 5/18/2004).

policymakers given recent findings in the literature. Results from recent studies suggest that improved health outcomes, a standard justification for increasing entrepreneurial tax incentives for health insurance, are not substantiated by the data.

This analysis also contributes to the literature by going beyond the effects of tax rates to examine another aspect of the tax system. The general consensus from the empirical literature on taxes and entrepreneurship is that taxes matter in entrepreneurial decisions. However, these studies focus almost exclusively on tax rates. Given the tax rate effects, it seems reasonable to expect that other facets of the tax system that affect tax liabilities might also generate behavioral responses. Evidence that the tax incentives improve the duration of entrepreneurial activities would suggest that exempting health insurance premiums from the payroll tax would boost entrepreneurship.

The remainder of this document is organized as follows. Section 2 provides a brief history of the relative tax treatment of health insurance premiums paid by entrepreneurs. The prior literature is summarized in Section 3. Section 4 contains a description of the data and empirical methodology. Results are presented in Section 5, and Section 6 concludes with policy implications and directions for future work.

## ***2. Health Insurance and Entrepreneurs***

To see how health insurance tax incentives might alter entrepreneurial decisions, consider a household that maximizes expected utility, where the utility function depends both on the level and variance of household income. In this context, health insurance provides a safeguard against large payments for health services in the event of an

accident or illness.<sup>6</sup> In this case, higher relative prices for health insurance raise the price faced by entrepreneurs for reducing risk.<sup>7</sup> If households differ in both risk attitudes and entrepreneurial ability, households affected at the margin might include those with high levels of ability but with lower tolerances for risk. These high ability households, those most likely to produce innovations and create new jobs, might forgo an entrepreneurial activity in favor of the relatively more stable wage and salary sector.

As noted above, the self-employed were not able to deduct income spent on health insurance premiums for themselves and their dependents when calculating income tax or payroll tax liabilities prior to 1987. As a result of the Tax Reform Act of 1986, the self-employed (primarily Schedule C and F filers) with net profits were able to deduct 25 percent of their health insurance premiums when calculating income tax liabilities beginning in 1987.<sup>8</sup> Availability was expanded in 1990 to include filers who were more than two percent shareholders in an S corporation.<sup>9</sup>

The temporary health insurance deduction was allowed to expire in 1992 but was made retroactively available for those filing an amended return (Holtz-Eakin, Penrod, and Rosen, 1996). Temporary deductions were available until 1997 when the deduction was made permanent and increased to 40 percent. Further incremental increases were made in 1998 (45 percent), 1999 (60 percent), and 2002 (79 percent). Effective in 2003, 100 percent of self-employed insurance premiums became deductible in calculating income

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<sup>6</sup> One might test this assertion by examining the health insurance policies purchased by entrepreneurs. A preference for policies designed to protect against low probability, high cost events would add credence to the risk motivation argument. Such detail is not available in the data used for this project.

<sup>7</sup> Compounding the price effects from differential tax treatment is the fact that entrepreneurs generally face higher insurance premium costs than their wage and salary counterparts as small employers are not able to take advantage of the risk-pooling available to larger firms (Burman et al., 2003).

<sup>8</sup> To claim the deduction filers must have had net profits from their small business and not be eligible for employer-provided health insurance (including spousal plans).

<sup>9</sup> See Internal Revenue Code 16 U.S.C. Sec.162(l) (5).

tax liabilities.

However, this 100 percent income tax deduction did not equalize the treatment of health insurance premiums paid on behalf of the self-employed and wage and salary workers. Unlike premiums paid by employers, the self-employed must still pay Self-Employment Contributions Act (SECA), or payroll taxes, on income used to pay insurance premiums for themselves and their dependents.<sup>10</sup> Insurance premiums for wage and salary employees are generally paid out of pre-tax dollars; thus, this income is not subject to the federal income tax or Federal Insurance Contributions Act (FICA) taxes.<sup>11</sup> Further compounding the issue is the fact that most households now pay more payroll taxes than income taxes (Mitrusi and Poterba, 2000).

Differential tax treatment of self-employed and wage and salary health insurance premiums might be expected to affect entrepreneurship rates through two avenues. The relatively higher cost of health insurance might 1) deter entry or 2) expedite exit. Empirical studies of the impacts on entry have produced inconclusive results (as discussed below) and this study is the first to examine the effects of health insurance deductibility on the probability of entrepreneurial exit.

To the extent that the differential tax treatment distorts household decisions, it causes inefficiencies as labor is not allocated to its most productive use. For example, consider an entrepreneurial household weighing the expected benefits of its entrepreneurial activity against the risks. The differential tax treatment increases the

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<sup>10</sup> As the payroll tax contributions define future benefits, adding a SECA exemption is potentially detrimental for those with low income levels. For instance, Feldstein and Samwick (1992) find that the effective Social Security tax rate was negative for those with low earnings in 1990. Deducting income used to pay insurance premiums from SECA calculations would reduce the amount of payroll taxes paid and the value of future benefits. For households with a negative effective tax rate, the gain from avoiding current taxes is more than offset by the loss of future benefits.

<sup>11</sup> FICA and SECA taxes serve as the primary funding source for the Medicare and Social Security programs.

relative price of decreasing health related risks. In light of the higher relative price of insurance, the household decides that the cost of reducing the amount of risk it faces is too high and exits the entrepreneurial activity. This outcome is inefficient as resources that would have been devoted to the entrepreneurial activity are now being allocated to the wage and salary sector based only on price differences created by the tax system.

Equity is another concern with the differential tax treatment of health insurance premiums. The current policy results in unequal treatment of taxpayers' health insurance costs based only on their classification as self-employed or not. Efficiency and equity concerns are likely among those that have prompted recent legislation.

The purpose of this research is to add to the policy debate by investigating whether closing the health insurance tax incentive gap between employees and the self-employed enhances entrepreneurial survival. The current research investigates whether the 25 percent self-employment health insurance deduction implemented under the Tax Reform Act of 1986 had an effect on the probability of entrepreneurial exit. Admittedly, the 25 percent deduction represented a modest savings for a self-employed filer. For example, among those claiming the deduction in 1988, the average value was \$428.<sup>12</sup> For a household in the 28 percent tax bracket, this represents a tax savings of \$120 or 7 percent of the premium total.<sup>13</sup>

Evidence of a response to this modest tax incentive would suggest that larger incentives, such as the 100 percent income tax deduction or the proposed exemption from SECA taxes, might be expected to generate a behavioral response. Conversely, the

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<sup>12</sup> This is from the author's calculation using the tax return data for this paper.

<sup>13</sup> A deduction valued at \$428 represents at most a quarter of average premiums paid (this is a lower bound as deductions are only allowed in the presence of profits). Thus, 28 percent of \$428 gives a tax savings of \$120. Dividing this savings by the estimated premium amount (\$,1712) gives a deduction worth 7 percent of the premium paid.

absence of an effect would suggest the need for further research.

### ***3. Previous Literature***

Two studies have addressed the effects of health insurance availability on entrepreneurship, but neither specifically addresses tax incentives or entrepreneurial survival. The possibility that employer-provided insurance creates job-lock and discourages transitions to entrepreneurship is examined by Holtz-Eakin, Penrod, and Rosen (1996). The authors use longitudinal data from the Survey of Income and Program Participation and a difference in differences approach to compare wage and salary individuals with individuals who transition into self-employment. They find no statistically significant effects of health insurance portability on transitions into entrepreneurship.

Results from a more recent study seem to contradict these conclusions. Wellington (2004) considers the effects of health insurance coverage on the probability of entrepreneurship. She uses a cross-section of data from the 1993 Current Population Survey and finds that the availability of coverage from another source (spouse) increases the likelihood of entrepreneurship between 2 and 5 percentage points.

Several studies focus specifically on the effectiveness of tax incentives to encourage health insurance coverage.<sup>14</sup> While not the focus of the current research, this topic is worth exploring briefly because it provides insight into whether or not tax incentives are expected to generate behavioral responses. Examining small and large firms alike, Gruber and Lettau (2004) find that firms are quite responsive to health

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<sup>14</sup> See Feldstein (1973).

insurance tax incentives. Small firms (less than 100 employees) were most responsive in their decisions to offer insurance as an employee benefit. Large firms (more than 1,000 employees) were more responsive in levels of spending on employee health premiums. The authors conclude that tax incentives are critical for maintaining an employer-provided health insurance system.

The decision to offer health insurance is also explored by Gruber and Poterba (1994). Their results suggest that a one percent increase in the price of insurance reduces the probability that a single, self-employed person will purchase health insurance by nearly two percentage points. The conclusion that firms, including the self-employed, are quite responsive to health insurance tax incentives is echoed in studies of taxable income (Wu 2005) and the responsiveness of the self-employed to tax incentives targeted at savings (Power and Rider 2002). The self-employed are more likely to contribute to tax-deferred retirement savings plans and contribute more as the after-tax price declines. In addition, Bruce (2002) and Bruce and Gurley (2005) provide evidence that taxes have a significant affect on entrepreneurial endurance, but the authors only consider tax rates.<sup>15</sup> The results from these studies indicate that entrepreneurs respond to tax incentives suggesting that changing health insurance deductibility might generate behavioral responses.

The literature on health insurance coverage and health outcomes among the self-employed suggests that despite lower rates of health insurance coverage, the self-employed experience the same health outcomes as their wage and salary counterparts.<sup>16</sup>

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<sup>15</sup> A number of studies have examined entrepreneurial survival empirically in a multivariate context (e.g., Bates 1990, Holtz-Eakin, Joulfaian, and Rosen 1994, and Taylor 1999), but only Bruce (2002) and Bruce and Gurley (2005) address the effects of taxes.

<sup>16</sup> See Holtz-Eakin, Penrod, and Rosen (1996), Health Insurance Association of America (2003) and Perry

There is no evidence of a selection bias as the health status of those entering entrepreneurship is indistinguishable from those who remain in wage and salary employment.<sup>17</sup> Additionally, health status is not a significant predictor of exit from an entrepreneurial activity.<sup>18</sup> Thus, the literature does not support tax incentives for health insurance as an effective policy for improving health outcomes.

In summary the literature provides a general guideline for thinking about the issue of health insurance tax incentives and entrepreneurship. First, the evidence on whether health insurance availability affects decisions to undertake an entrepreneurial activity is mixed. Second, entrepreneurs are generally responsive to tax incentives and particularly in their decisions to purchase health insurance, suggesting that tax incentives might indeed be expected to generate behavioral effects. Finally, lower rates of health insurance coverage among the self-employed do not lead to relatively worse health outcomes. This last point is essential to the policy debate as it suggests that concerns other than health outcomes, including equity of the tax system and the effects of tax incentives on entrepreneurial survival, might be most relevant in policy discussions.

#### ***4. Data and Methodology***

A tangible definition of entrepreneurship is necessary in order to empirically examine its responsiveness to tax policy. Generally, an entrepreneur might be described

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and Rosen (2004) for evidence on lower rates of health insurance coverage among the self-employed. Perry and Rosen (2004) estimate that the self-employed are 25 percent less likely to be insured than their wage and salary counterparts. See Currie and Gruber (1996), Ross and Mirowsky (2000), Meara (2001), Newhouse (1993) and Perry and Rosen (2004) for evidence on the weak link between health coverage and health outcomes.

<sup>17</sup> See Holtz-Eakin, Penrod, and Rosen (1996).

<sup>18</sup> See Holtz-Eakin, Penrod, and Rosen (1996) and Perry and Rosen (2004).

as daring and innovative or someone who takes unusual risk. The quantifiable proxy for entrepreneurship most often employed in the literature is self-employment. This measure potentially overstates entrepreneurship as one can envision self-employed persons who are not entrepreneurs, such as chain store owners or consultants. However, self-employment might also understate entrepreneurship as some innovative individuals are likely to be working in larger, more established businesses. Overall, self-employment seems to be a reasonable (and likely the best available) proxy for entrepreneurship in addition to being the measure used in the majority of the previous literature.

Most previous work has relied on self-reported survey responses to identify entrepreneurs while more recent studies have turned to tax return data. A key advantage of the tax return data is the ability to precisely identify entrepreneurs based on filing status rather than survey responses. Blanchflower and Oswald (1998) found that a majority of individuals report a desire to be self-employed but a small number actually achieve this goal. A desire on the part of respondents to be entrepreneurs coupled with differing definitions of what activities qualify as entrepreneurial diminish the precision of survey classifications.

Entrepreneurs are here identified as individuals who file a Schedule C along with their tax return. This selection criterion is simple and precise as well as consistent with the recent literature. This focus on Schedule C filers is further justified as these sole proprietors are most likely to be eligible for the health insurance deduction.<sup>19</sup> This restriction also seems justified as results from recent research, utilizing the same data source, are remarkably consistent across entrepreneurship measures (Bruce and Holtz-

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<sup>19</sup> Experimentation with other measures used in the literature (partnership, S corporation, or rent and royalty income) resulted in too few entrepreneurs claiming the deduction to get reliable estimates.

Eakin 2001; Bruce and Gurley 2004).

The data for this project are drawn from the University of Michigan Tax Research Database. This panel of data was constructed by the Office of Tax Policy Research (OTPR) at the University of Michigan from the public-use tax return data released by the Internal Revenue Service Statistics of Income Division. The data contain nearly 300,000 tax returns representing a random sample of all filers. Approximately 6,000 households are present in all twelve years of the data.

Although the panel contains data for 1979-1990, a health insurance deduction was only available to entrepreneurs following the Tax Reform Act of 1986, as noted above. In addition to an indicator of whether a household claimed a health insurance deduction, the data include the dollar amounts of these deductions. As discussed above, the analysis is limited to sole proprietors as it is appropriate to focus on those eligible for the health insurance deduction, and sole proprietors are more likely to meet this criterion than other possible measures of entrepreneurship.

Figure 1 presents the proportion of Schedule C filers reporting a health insurance deduction for years 1988-1990.<sup>20</sup> Overall, the share of Schedule C filers claiming the deduction increased by 4 percentage points from just over 11 percent in 1988 to more than 15 percent in 1990. The average dollar value of deductions claimed also increased from \$427 to \$536 (Figure 2). As these values reflect at most 25 percent of the health insurance premiums paid, a conservative estimate for average annual premiums is \$1,708 to \$2,144.<sup>21</sup>

In previous studies of entrepreneurial transitions, analyses have been conducted

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<sup>20</sup> 1987 is not included due to insufficient sample size.

<sup>21</sup> The health insurance deduction could not exceed net profits.

separately by marital status.<sup>22</sup> This is necessary as decision factors are likely to differ systematically by filing status. For instance, single filers are likely to be younger, have fewer dependants, and have larger variations in income. The necessity for separate analyses is compounded when considering the effects of health insurance as married filers potentially have access to health insurance through a spouse.

Use of the health insurance deduction and dollar amounts claimed are reported by marital status in Figures 1 and 2. In 1988 married filers were more likely to claim the deduction (11.14 percent) than single filers (10.70 percent). The growth in use from 1988-1990 for single filers outpaced that of married filers so that by the end of the three-year period single filers were slightly more likely to report a deduction (15.35 percent versus 14.92 percent).<sup>23</sup>

Unsurprisingly, single filers had smaller deductions on average (Figure 2). In 1990 the average value of the deduction was 56.38 percent higher for married filers (\$610.24) than for single filers (\$344.05). This is likely because married filers have more dependents and are generally older and therefore pay higher premiums. Both groups of filers experienced an increase in the average value reported between 1988 and 1990 (28.07 percent for married filers and 24.66 percent for single filers). The increase for married filers primarily took place from 1988 to 1989 while single filers experienced higher growth in the average value of deductions from 1989 to 1990.

Entrepreneurial exit is defined as engaging in an entrepreneurial activity in one year (filing a Schedule C) and not the following year, as in Bruce and Gurley (2005).<sup>24</sup>

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<sup>22</sup> See Bruce and Holtz-Eakin (2001) and Bruce and Gurley (2005).

<sup>23</sup> Health insurance deduction rates by filing status (single, married) are not statistically different at normal levels of significance.

<sup>24</sup> This is the same criterion used by Bruce and Gurley (2005).

This simple indicator avoids more complicated issues such as degree of entrepreneurship (e.g. percentage of total income derived from entrepreneurial activities) or whether a venture is risky enough to be considered entrepreneurial (e.g. those that exhibit substantial losses). Attempts to capture the most innovative or daring entrepreneurs by restricting the sample based on income levels from entrepreneurship are complicated by the potential for losses. While those assuming the most risk are likely to have larger variations in income, large profits or losses do not necessarily indicate a truly innovative venture. This issue is further complicated by the presence of business related deductions including depreciation.

Table 1 contains evidence suggesting that health insurance deductions might decrease exit rates among Schedule C filers. The first entry in Table 1 indicates that 6.93 percent of Schedule C filers claiming a deduction in 1988 had exited entrepreneurship by 1989. The exit rate for those not claiming the deduction in 1988 was significantly higher at 19.65 percent. The pattern is similar across years and filing status.<sup>25</sup> A discrete choice framework is used to analyze the effects of health insurance deductibility on entrepreneurial exit as in Bruce and Gurley (2005).<sup>26</sup>

The estimated equation is of the form:

$$D_{i,t+1} = \beta' X_{i,t} + \tau T_{i,t+1} + \gamma H_{i,t} + \mu_i + \nu_{i,t+1}$$

where  $D_{i,t+1}$  is a binary variable, which takes a value of 1 if an individual is engaged in an entrepreneurial activity as of time  $t$  and not engaged in an entrepreneurial activity as of

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<sup>25</sup> The small number of exits highlights the importance of going beyond simple indicators for health insurance deductions. Using the dollar value of deductions in multivariate models will provide greater variation for estimating the effects of health insurance deductibility.

<sup>26</sup> The above equation is estimated via a random effects probit. The lack of a longer panel of data (following the introduction of the health insurance deduction) precludes the use of more sophisticated duration analysis techniques to examine the effects of the health insurance deduction on *spells* of entrepreneurship.

time  $t + 1$  and zero if the household remains in the entrepreneurship sector in both  $t$  and  $t + 1$ .  $X_{i,t}$  is a vector containing a constant and a set of exogenous control variables as of time  $t$ .  $T_{i,t+1}$  contains household level tax rates (entrepreneurial and wage and salary income) as of time  $t + 1$ .<sup>27</sup>  $H_{i,t}$  contains information regarding the health insurance deduction at time  $t$ . In some of the models estimated below it is a dummy variable taking a value of one if the health insurance deduction was used. In other models it represents the dollar value of the health insurance deduction. The time  $t$  deduction amount is used to avoid potential endogeneity of the health insurance variable, which is a concern if a household's employment sector affects its ability to claim the deduction.

The error term in this equation includes an individual-specific time-invariant random effect ( $\mu_i$ ), to capture unobserved individual heterogeneity, and an independently and identically distributed residual component ( $v_{i,t+1}$ ) with zero mean and finite variance.<sup>28</sup>

The ability to account for unobserved individual heterogeneity is particularly valuable given that the data set does not contain much in the way of demographic information. Education, race, and gender are among the missing variables for which there does not appear to be even a rough proxy. However, the panel of tax returns provides more in terms of additional control variables than might be immediately apparent. Proxies are included in the estimation for age, household size, age of children,

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<sup>27</sup> Tax rates as of time  $t+1$  are potentially endogenous as the chosen employment sector (wage and salary or self-employment) is likely to affect the observed tax rate. The instrumental variables approach used in Bruce and Gurley (2005) is also used to address tax rate endogeneity here.

<sup>28</sup> Most of the existing empirical literature follows the custom of limiting the sample to male heads of household who are of prime working age (25-54). Due to the lack of demographic information, it is not possible to limit the sample in such a fashion. However, separate analyses are conducted for married and single households. In the case of a single filer, the household self-employment decision is equivalent to the individual decision.

liquidity constraints, and risk attitudes.<sup>29</sup> Aggregations of state identifiers in the tax panel are used to control for region of residence.<sup>30</sup>

## 5. Results

Baseline results are presented in Table 2. The top section contains results by marital status for the analysis using a dummy variable to indicate health insurance deductions. Models excluding the health insurance indicator are also reported for comparisons to previous literature. The first result of note is that the presence of a health insurance deduction reduces the probability of exit for both single and married filers.

Marginal effects for the health insurance dummy variable are used to give the results in Table 2 more meaningful interpretation. The presence of a health insurance deduction decreases the probability of exit by 2.65 percentage points for single filers. Given that the overall probability of exit for single filers is 24.49 percent, this represents a reduction in the probability of exit of 10.82 percent.<sup>31</sup> For married filers, the presence of a health insurance deduction reduces the probability of exit by 10.52 percentage points. This represents a large effect when compared with the average exit rate for married filers of 16.19 percent.

The bottom section of Table 2 contains results replacing the dummy variable for a health insurance deduction with the dollar amount claimed. This specification allows for more variation in the health insurance variable. Results are consistent with the above and indicate that the probability of exit decreases as the dollar value of the health insurance

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<sup>29</sup> See Bruce and Gurley (2005) for further discussion of the control variables.

<sup>30</sup> Another indicator for “missing region” is also necessary as the state identifiers are omitted for any return with an adjusted gross income of \$200,000 or more in order to guarantee confidentiality. Dummy variables are also included to account for year fixed effects.

<sup>31</sup> See Appendix Table.

deduction increases.

Specifically, modest increases in the dollar value of the deduction produce reductions in the probability of exit similar to the effects of the dummy for availability of the health insurance deduction. For single filers, a 10 percent increase in the dollar value of the deduction (from an average of \$344.05 to \$378.46) reduces the probability of exit by 10.62 percent. The elasticity of the probability of exit with respect to the dollar value of the health insurance deduction is equal to the percent change in the probability of exit given a one percent change in the dollar value of the health insurance deductions.

Elasticities are much smaller for married filers (-0.12) than for single filers (-1.06). For married filers, a 10 percent increase in the average dollar value of the health insurance deduction (from \$610.24 to \$671.26) yields a 1.23 percent decrease in the probability of exit.

Tax rates are also significant in determining exit; an increase in the relative tax rate in a wage job decreases exit whereas a relative increase in the entrepreneurial tax rate increases the probability of exit. These tax rate results are consistent with Bruce and Gurley (2005). To assess the possibility that the consistent tax rate results for the shorter panel are sensitive to the inclusion of the health dummy, models excluding the dummy variable for the presence of a health insurance deduction are also shown in Table 2. For both single and married filers, the coefficients on the wage and entrepreneurial marginal tax rates (among all other significant variables) are nearly identical and still statistically significant in the more parsimonious models.

Other significant results include lower probabilities of exit for married filers in the West, Midwest, and Northeast relative to the South. High-income households are also

less likely to exit regardless of filing status. Filers with a mortgage interest deduction are more likely to exit, echoing the results of Bruce and Gurley (2005). This possibly indicates that the presence of a mortgage signals that households are close to their borrowing capacity and are therefore, liquidity constrained.

As in Bruce and Gurley (2005), an across the board tax *rate* cut of one percentage point would be expected to result in less exit than otherwise would have been observed (4.02 percentage points for married filers). Interestingly, the same effect could be achieved by increasing the value of the health insurance deduction by approximately 80 percent. This suggests that increasing the allowable federal income tax deduction from 25 percent in 1996 to 45 percent in 1998 could have had significant impacts on the survival of entrepreneurs.<sup>32</sup> In fact, the results indicate that this increase would have been equivalent to a reduction of one percentage point in the marginal tax rates of married filers.

Taken together, the results indicate that entrepreneurs are sensitive to multiple aspects of the tax system, including relative tax rates and tax incentives targeted at health insurance. The consistently significant and large effects from the 25 percent health insurance deductibility in 1988-1990 suggest that allowing a health insurance deduction from the calculation of SECA taxes might also significantly enhance survival. Full deductibility (100 percent) of health insurance premiums from the SECA tax would represent an increase in the value of the health insurance deduction of about 15 percent.<sup>33</sup>

One possible concern with the above analysis is that the estimated models make no attempt to control for “degree” of entrepreneurship. For instance, more successful or

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<sup>32</sup> Note that there was an intermediate increase to 40 percent in 1997.

<sup>33</sup> Assuming that the taxpayer is below the SECA income cap, \$90,000 as of 2005 (Whitman, 2005).

experienced entrepreneurs are less likely to exit entrepreneurship<sup>34</sup> but might also be more likely to make use of the health insurance deduction (as they have less access to employer-provided health insurance). To test for this possibility, each model was re-estimated including a dummy variable to indicate whether the household participated in entrepreneurship “full-time” (that is, the household had no wage or salary income).

Figure 3 presents the percentage of Schedule C filers that were full-time entrepreneurs by marital status. As expected, single filers are much more likely to be full-time entrepreneurs. The trend in full-time entrepreneurship declined for both filing status groups over the time period. Full-time entrepreneurship rates declined from over 50 percent for single filers in 1979 to less than 44 percent in 1990. The percent of married entrepreneurs with no wage or salary income fell from almost 27 percent in 1979 to just over 20 percent in 1990.

Results from the multivariate analysis indicate that being a full-time entrepreneur does indeed lead to significantly lower probabilities of exit (25.66 percentage points for single filers and 10.63 percentage points for married filers). However, the inclusion of this control variable does not alter the finding that the presence of a health insurance deduction lowers the probability of exit and this effect increases with the dollar value of the deduction. For married filers the differences from including the full-time control are minimal. The presence of the deduction lowers the probability of exit by 8.84 percentage points (instead of 10.52 percentage points) and the elasticity of the probability of exit with respect to the dollar value of the health insurance deduction is -0.10 (instead of -0.12).

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<sup>34</sup> See Holtz-Eakin, Joulfaian, and Rosen (1994) for evidence that more successful entrepreneurs (in terms of Schedule C receipts) are less likely to exit, *ceteris paribus*. See Taylor (1999) for evidence that previous self-employment experience decreased the probability of exit.

The results for single filers are more interesting. Including the control for full-time status *increases* the effects of the presence of the health insurance deduction to 6.64 percentage points (instead of 2.65 percentage points). The effects of the dollar value of the deduction are still significant but the elasticity is much smaller -0.15 (instead of -1.06). In essence, the inclusion of the full-time control produces effects for single filers that are more in-line with those of the married filers.

## ***6. Conclusions and Further Work***

The panel data provide convincing and consistent evidence that health insurance deductibility from the calculation of income taxes leads to enhanced entrepreneurial survival. The presence of large behavioral responses associated with the 25 percent deductibility available from 1988-1990 strongly suggests that further increases in deductibility to 100 percent in 2003 likely led to higher levels of entrepreneurship than otherwise would have been observed. In addition, the results imply that allowing the deduction of health insurance premiums when calculating SECA tax liabilities would also increase the longevity of entrepreneurial ventures.

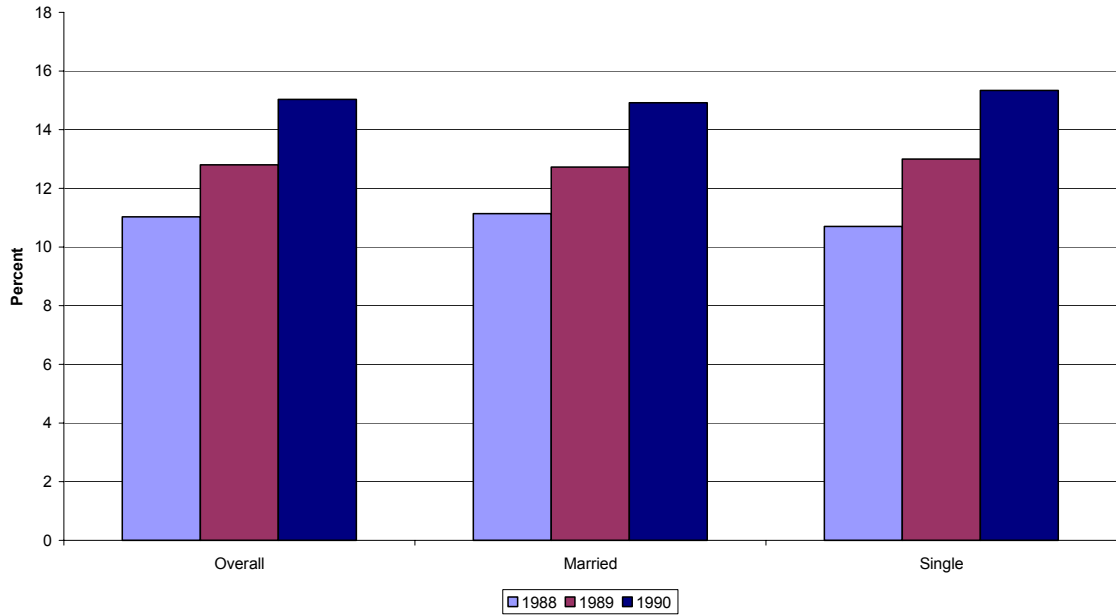
More broadly, these results provide further evidence that changing other aspects of the tax code, beyond the tax rates which are most commonly studied, can potentially create significant behavioral responses. Updating this analysis with a longer, more current panel of tax data would be a useful exercise for future research. Additional areas for future research on the effects of taxes on entrepreneurship include exploring other tax incentives such as retirement savings plans, depreciation allowances and use of business deductions for larger vehicles including sport utility vehicles.

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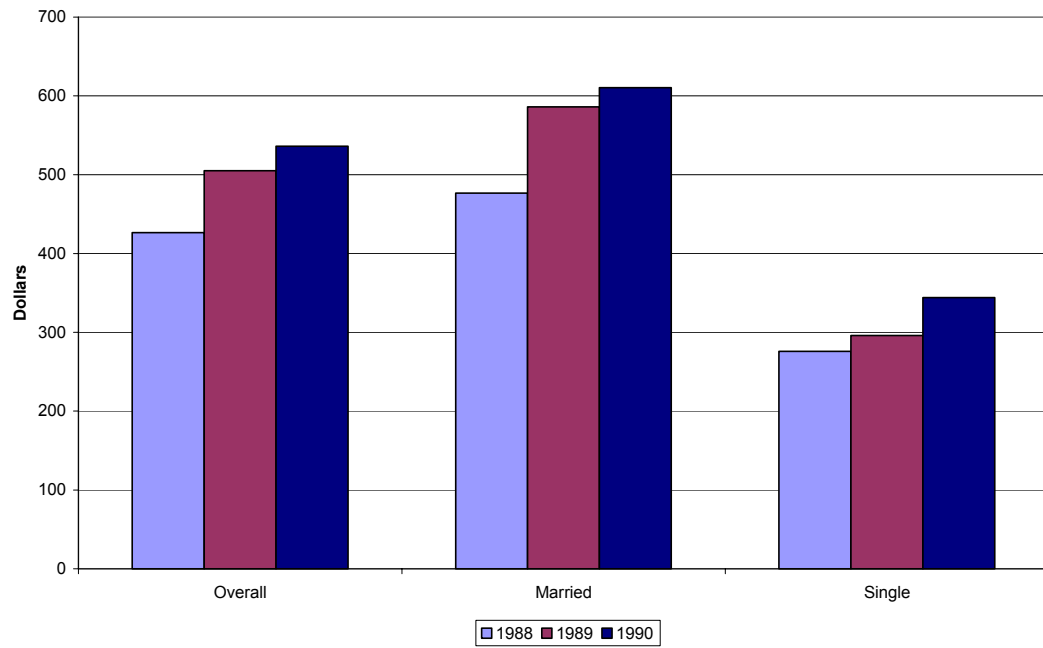
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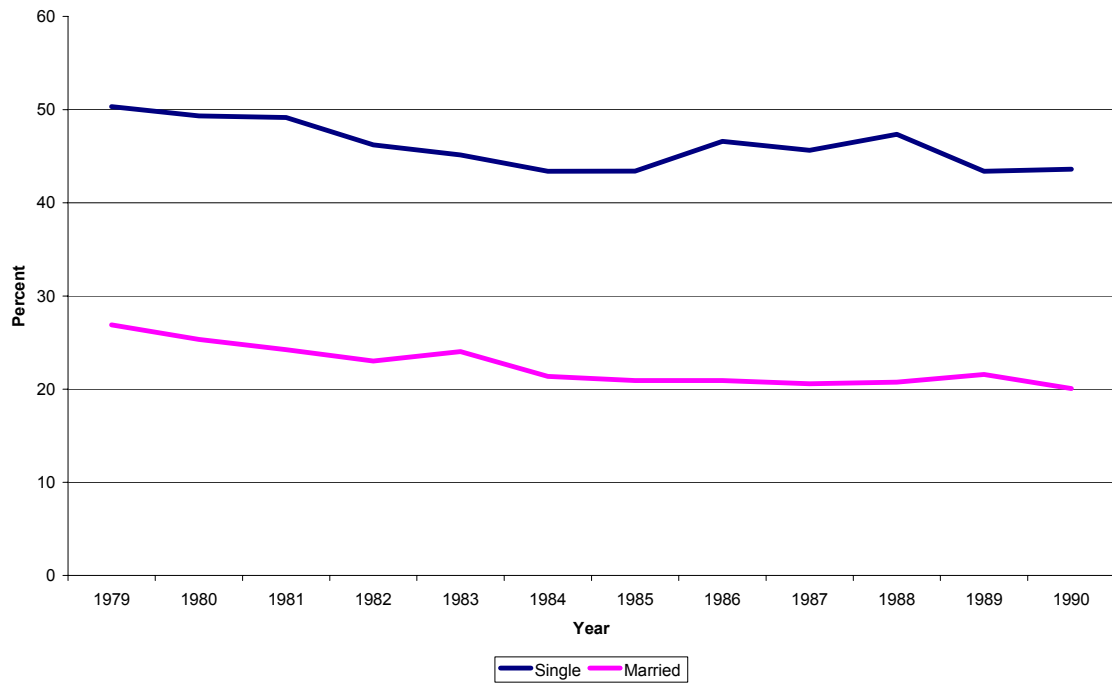
**Figure 1: Percent of Schedule C Filers Claiming a Health Insurance Deduction**



**Figure 2: Dollar Value of Health Insurance Deductions Claimed by Schedule C Filers**



**Figure 3: Percent of Schedule C Filers with No Wage Income**



**Table 1: Exit Rates for Schedule C Filers  
by Previous Year's Health Insurance Deduction Status\***

		All Schedule C Filers	Married Filers	Single Filers
1989 Exit Rates	Deduction	6.93% (19 / 274)	7.21% (15 / 208)	6.06% (4 / 66)
	No Deduction	19.65% (465 / 2,117)	17.85% (287 / 1,608)	25.34% (129 / 509)
	Overall	18.19% (435 / 2,391)	16.63% (302 / 1,816)	23.13% (133 / 575)
1990 Exit Rates	Deduction	8.05% (26 / 323)	5.96% (14 / 235)	13.64% (12 / 88)
	No Deduction	19.70% (425 / 2,157)	17.25% (279 / 1,617)	27.04% (146 / 540)
	Overall	18.19% (451 / 2,480)	15.82% (293 / 1,852)	25.16% (158 / 628)

Differences in exit rates by deduction status are statistically significant at the 1 percent level for each filing status group (all Schedule C, married, and single filers).

**Table 2: Baseline Health Analysis**  
**Dummy Variable for Health Insurance Deductibility**

	Single				Married			
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>
<b>Health Ins. Ded. (Dummy)</b>	<b>-1.139</b>	0.407	--	--	<b>-0.644</b>	0.103	--	--
<b>Wage MTR</b>	<b>-0.612</b>	0.203	<b>-0.619</b>	0.165	<b>-0.072</b>	0.013	<b>-0.071</b>	0.013
<b>Entrepreneurship MTR</b>	<b>0.697</b>	0.192	<b>0.745</b>	0.208	<b>0.257</b>	0.058	<b>0.260</b>	0.060
<b>Age 65</b>	-2.593	1.480	-2.508	1.316	0.687	0.353	0.675	0.360
<b>West</b>	0.709	0.461	0.620	0.417	<b>-0.354</b>	0.105	<b>-0.389</b>	0.106
<b>Midwest</b>	0.262	0.539	0.113	0.485	<b>-0.307</b>	0.135	<b>-0.342</b>	0.138
<b>Northeast</b>	-0.277	0.677	-0.477	0.661	<b>-0.689</b>	0.191	<b>-0.728</b>	0.197
<b>Other Region</b>	<b>4.595</b>	1.988	<b>4.872</b>	2.030	-6.994	7.5E+06	-6.279	6.3E+05
<b>Missing Region</b>	<b>-4.750</b>	1.587	<b>-4.637</b>	1.304	<b>-0.690</b>	0.246	<b>-0.779</b>	0.248
<b>Mortgage Interest Ded.</b>	<b>2.648</b>	0.798	<b>2.612</b>	0.690	<b>0.382</b>	0.084	<b>0.377</b>	0.085
<b>Kids Home</b>	-0.413	0.596	-0.383	0.603	0.112	0.084	0.105	0.084
<b>Kids Away</b>	0.751	0.925	0.745	0.840	-0.789	0.490	-0.788	0.486
<b>Total Exemptions</b>	0.465	0.457	0.437	0.446	-0.111	0.080	-0.103	0.080
<b>Balance Due (\$100)</b>	-0.019	0.023	-0.029	0.024	-0.002	0.002	-0.003	0.002
<b>Sample Size</b>	1311		1311		3786		3786	

**Bold type** indicates statistical significance at the five percent level or better.

**Table 2 (cont): Baseline Health Analysis**  
**Dollar Amount of Health Insurance Deduction**

	Single				Married			
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>
<b>Health Ins. Dollar Amt. (\$100)</b>	<b>-0.863</b>	0.239	--	--	<b>-0.118</b>	0.021	--	--
<b>Wage MTR</b>	<b>-0.892</b>	0.194	<b>-0.619</b>	0.165	<b>-0.075</b>	0.013	<b>-0.071</b>	0.013
<b>Entrepreneurship MTR</b>	<b>0.677</b>	0.176	<b>0.745</b>	0.208	<b>0.257</b>	0.058	<b>0.260</b>	0.060
<b>Age 65</b>	<b>-3.899</b>	1.337	-2.508	1.316	0.653	0.352	0.675	0.360
<b>West</b>	<b>1.178</b>	0.502	0.620	0.417	<b>-0.362</b>	0.105	<b>-0.389</b>	0.106
<b>Midwest</b>	0.770	0.496	0.113	0.485	<b>-0.301</b>	0.135	<b>-0.342</b>	0.138
<b>Northeast</b>	0.742	0.674	-0.477	0.661	<b>-0.687</b>	0.191	<b>-0.728</b>	0.197
<b>Other Region</b>	<b>6.045</b>	2.774	<b>4.872</b>	2.030	-7.372	3.3E+07	-6.962	7.5E+06
<b>Missing Region</b>	<b>-7.397</b>	1.893	<b>-4.637</b>	1.304	<b>-0.706</b>	0.246	<b>-0.779</b>	0.248
<b>Mortgage Interest Ded.</b>	<b>3.403</b>	0.768	<b>2.612</b>	0.690	<b>0.395</b>	0.084	<b>0.377</b>	0.085
<b>Kids Home</b>	<b>-1.228</b>	0.624	-0.383	0.603	0.107	0.084	0.105	0.084
<b>Kids Away</b>	1.102	0.882	0.745	0.840	-0.792	0.490	-0.788	0.486
<b>Total Exemptions</b>	<b>1.096</b>	0.487	0.437	0.446	-0.105	0.080	-0.103	0.080
<b>Balance Due (\$100)</b>	0.002	0.027	-0.029	0.024	-0.002	0.002	-0.003	0.002
<b>Sample Size</b>	1311		1311		3786		3786	

**Bold type** indicates statistical significance at the five percent level or better.

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**Appendix Table: Summary Statistics**  
**Data Used in the Exit Analysis**

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	<i>Single</i>		<i>Married</i>	
	<i>Mean</i>	<i>Std.</i>	<i>Mean</i>	<i>Std.</i>
<b>Exit*</b>	0.245	0.430	0.162	0.368
<b>Health Ins. Ded. (Dummy)</b>	0.121	0.327	0.121	0.326
<b>Health Ins. Dollar Amt. (\$100)</b>	0.363	1.195	0.643	2.521
<b>Wage MTR*</b>	31.915	2.411	35.119	3.640
<b>Entrepreneurship MTR*</b>	33.424	1.935	33.595	2.530
<b>Age 65</b>	0.089	0.285	0.093	0.290
<b>West</b>	0.278	0.448	0.227	0.419
<b>Midwest</b>	0.204	0.403	0.248	0.432
<b>Northeast</b>	0.214	0.410	0.164	0.370
<b>Other Region</b>	0.002	0.000	0.000	0.016
<b>Missing Region</b>	0.014	0.116	0.020	0.139
<b>Mortgage Interest Ded.</b>	0.242	0.428	0.497	0.500
<b>Kids Home</b>	0.278	0.677	1.142	1.220
<b>Kids Away</b>	0.017	0.155	0.006	0.086
<b>Total Exemptions</b>	1.430	0.890	3.302	1.247
<b>Balance Due (\$100)</b>	0.462	4.822	0.962	17.340
<b>Sample Size</b>	1311		3786	

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\*Variables denoted with an asterisk are as of time  $t + 1$ , all other variables are as of time  $t$ .

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