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# The Unobserved Returns to Entrepreneurship \*

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Job Market Paper

## Abstract

This paper seeks to understand the returns to self-employment. The analysis is motivated by the empirical puzzle that most entrepreneurs enter and persist in self-employment, despite lower initial earnings and earnings growth (Hamilton, 2000). I propose a new hypothesis to make sense of this observation. In particular, reported income is unlikely to be a good measure of the return to self-employment given the underreporting incentive, and opportunities available to business owners. Moreover, business owners also have access to multiple avenues for compensating themselves and their employees. As such, any survey of business owners will face great difficulties in capturing the many ways in which business income can be received. As evidence for the potential importance of such understating, Slemrod (2007) reports that the evasion rate amongst non-farm proprietorships varies between 18 and 57 percent depending on industry. In this paper, I make use of the PSID to test my hypothesis. The estimation strategy relies on the presumption that reported consumption by the self-employed will not be systematically misreported, even though income can easily be. The results indicate that individuals report earning 27 percent less but appear to consume 5 percent more in self-employment. This implies a 32 percent differential between reported wage and consumption for the self-employed, indicating that the former measure is not a good barometer of the financial returns to self-employment. Furthermore, this increased consumption does not seem to be offset by higher uncertainty as evidenced by my finding, that the variance in consumption while self-employed is not significantly different than that in wage employment. Other results include that the self-employed work longer hours and that consumption is the same as that prior to self-employment for those who return to wage employment.

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# 1 Introduction

Entrepreneurial activity is a key generator of economic development. Individuals and firms involved in such undertakings innovate, both on the product and process margins, creating new technologies and organizational novelties. Entrepreneurs are willing to internalize the risk involved in implementing new ideas, thereby bringing about positive externalities. The macroeconomic returns to entrepreneurial activity are clear; entrepreneurs modernize, create employment, bring about positive spillovers and engender economic growth. However, these positive returns do not translate quite so seamlessly at the microeconomic, individual level. It is not clear that individuals engaging in entrepreneurial activity always yield higher, or even equivalent returns to what they would otherwise receive in wage employment. Recent studies find negative median and average financial returns in self-employment relative to that in comparable wage-employment (Evans and Leighton (1989), Hamilton (2000)). This evidence gives rise to the question; what, if not financial returns propels individuals to move into and stay on in self-employment?

In order to better understand how to best encourage externality generating entrepreneurial activity, we must first identify the factors that induce individuals to engage in entrepreneurship. Empirical evidence, heralded primarily by Hamilton's finding that the median individual in self-employment for ten years makes 35 percent less than her wage-employed counterpart, indicates that we have to look to reasons beyond reported financial incentives to understand the motivations that underlie self-employment.

The literature currently proposes a few explanations to rationalize this curious observation. These explanations can be broadly categorized into heterogeneity in individual preferences over employment types, risk and time, and differences in beliefs. The two most prominent explanations that prevail are firstly, that the non-pecuniary benefits in self-employment compensate individuals for the lower financial return (Blanchflower et al. (2001), Hamilton (2000)). Non-pecuniary returns include the desire to work for oneself or for what one believes in (for example, individuals may possess ethical values on environmental or humanitarian issues), or the creative autonomy that self-employment facilitates. The second past explanation appeals to animal spirits, and is sometimes also referred to as overoptimism (Cooper et al. (1988), Dunne et al. (1988), Camerer and Lovo (1999)). New small businesses are found to be "overoptimistic" in that they have disproportionately high beliefs on survival and success probabilities for their own firm relative to those that are empirically observed. Furthermore, a penchant for risk <sup>1</sup> could also explain the choice of a riskier income with a lower mean. <sup>2</sup>

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<sup>1</sup>Or in the least a lower level of risk aversion

<sup>2</sup>Some further recent empirical evidence on risk aversion and business ownership, commonly referred to as the

In this paper, I re-establish Hamilton’s puzzle that the self-employed earn less, in a longitudinal setting. To make sense of this anomalous finding, I propose a new hypothesis. Namely, that reported income may not be a good measure of the returns to self-employment. The self-employed have the ability to underreport income and overstate expenditures. Any survey of the self-employed will capture an inaccurate income statistic that is guided by these motivations to underreport for tax purposes. Evidence for the prevalence of underreporting from [Slemrod \(2007\)](#) shows that 57 percent of non-farm proprietor income is not reported, summing to an approximated grand total of 68 billion dollars in 2006. Wage-income on the other hand, suffers from a 1 percent rate of underreporting. Furthermore, the self-employed have access to various avenues to compensate themselves that cannot be not easily captured in survey data. Given this, measuring the returns to self-employment through reported earnings will at best provide the absolute lowest bound of the true financial return, and more likely a severe underestimate.

In order to get around the problems that plague reported income, I estimate the returns to self-employment using consumption instead. My estimation strategy involves using reported expenditures from the Panel Study of Income Dynamics (PSID) to proxy for true financial returns. Under the assumption that consumption is not systematically misreported in either wage or self-employment, this alternative measure provides a more accurate portrayal of the actual realized returns, especially when making comparisons across the two employment types.

I find that while individuals report earning 27 percent *less* in self-employment, they in fact consume 5 percent *more*. This implies a 32 percent differential between reported earnings and reported consumption. [Figures 1 and 2](#) graphically summarize the most striking results of this paper. These two figures are cross-sectional representations of the distributions of wage earnings and consumption in the two employment sectors. In further dissecting the origin of this increased consumption, I find that consumption upon initial entry into self-employment is not significantly different than in wage employment, but with each additional year, the self-employed experience a 1.15 percent growth in consumption. Moreover, the variance of consumption is no different in self-employment than in wage-employment. However, individuals work an additional 138 hours annually in self-employment as compared to that in wage work. In looking beyond just those years in self-employment, I find that for those who do return to wage-employment, consumption is about the same as that prior to entering self-employment. In a nutshell, expected consumption is higher for those who remain in self-employment but drops to its level prior to self-employment once people return to wage-employment. Lastly, I find that individuals who do exceptionally well

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“private equity premium puzzle” is described in [Moskowitz and Vissing-Jørgensen \(2002\)](#).

while self-employed are more likely to leave, possibly being reclassified<sup>3</sup> as wage-employed due to entrepreneurial success.

The results from this paper suggest that the self-employed do not experience financial outcomes that are any worse. In fact those who do succeed as entrepreneurs and stay on in self-employment end up doing much better. Furthermore, I find no evidence that this higher mean is traded off with higher uncertainty. Despite this, given the longer work hours of the self-employed, the impact of self-employment on utility is unclear. One thing however is clear, the importance of financial returns can no longer be underestimated when evaluating the decision to persist in self-employment.

This paper is, one of few<sup>4</sup> to look at the returns to self-employment in a long panel setting, which enables the tracking of individuals over time and across employment spells. The two main novelties of the paper are that firstly, I document the returns to self employment holistically and estimate these returns in a panel setting, and that secondly I use consumption rather than income to estimate the financial returns to self-employment. In doing this, I provide some resolution for a puzzle which has plagued the literature for a while now; namely, given the lower observed earnings of most self-employed individuals, what motivates them to remain so? I do so by showing that when consumption is substituted for income as the measure of financial returns, the self-employed, especially those who persist, are in fact better off.

The rest of the paper is organized as follows. The remainder of this section details my main hypothesis, that reported income may not be a good measure of the returns to self-employment. The hypothesis involves a discussion of various accounting and measurement concerns, and the possibility of human capital accumulation. Section 2 describes the data and provides some summary statistics that characterize the environment of the self-employed. In section 3 I outline my estimation strategy and discuss the empirical findings. Section 4 drafts possible future extensions and lastly, section 5 summarizes the findings and concludes.

## 1.1 New Hypothesis

### 1.1.1 Tax Evasion

As documented in [Andreoni et al. \(1998\)](#) and [Slemrod \(2007\)](#), reported income is not a good measure of the true financial returns to self-employment due to the different avenues for reporting, or lack thereof, available to the self-employed but not the wage employed. The self-employed have a greater degree of discretion than the wage employed in where and whether to report income and

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<sup>3</sup>Refer to section 1.1.3 for a discussion of reclassification.

<sup>4</sup>See [Evans and Leighton \(1989\)](#).

expenses. So long as tax rates on earnings are positive, business owners have an incentive to underreport their business income. [Andreoni et al. \(1998\)](#) find that taxpayers who have derived income from farms or sole proprietorships tend to understate their taxes by considerably more than other taxpayers. They find using 1985 US data that sole-proprietors are likely to understate taxes between 16 and 39 percent, depending on occupation. More recent evidence from [Slemrod \(2007\)](#) corroborates this finding. This paper provides evidence on the different avenues of underreporting that comprises the 2001 tax gap. Slemrod reports that wage income is underreported by 1 percent, while business income is underreported by between 18 and 57 percent,<sup>5</sup> depending on the business classification, with non-farm proprietor income having both the largest tax gap and the highest rate of underreporting. A final piece of evidence from [Engstrom and Holmlund \(2009\)](#), is that income underreporting by the self-employed in Sweden runs at about 30 percent. This suggests that measuring the returns to self-employment using wage income alone may underestimate the true financial returns to self-employment, not only in the US, but in other countries as well.

The paragraph above highlights that income underreporting is endemic to self-employment. As such it would seem natural that individuals, on average, would make their decisions to enter and stay on in self-employment taking into consideration these true financial returns, not just what is reported to the IRS. When using any reported income statistic, the empirical researcher most likely only observes the latter.

### **1.1.2 Different Forms of Income**

Another source of mis-measurement arises since the self-employed have the ability to pay themselves in different, less easily quantifiable forms. For example, an entrepreneur can pay himself both a salary and shares in the firm. Even if reported earnings include these shares, which is unclear, the entrepreneur has an incentive to undervalue them. In particular, the declared value of these shares is taxed as ordinary income, whereas subsequent increases in the value of these shares are taxed as capital gains. Both founders and employees have an incentive to declare a virtually zero value for the firm due to the significant difference between income and capital gains tax rates. Capital gains taxes, currently a flat rate of 15 percent, are substantially lower than income taxes. Furthermore, there are special capital gains provisions for small businesses with capital gains taxed at half of the standard rate but capital losses treated as ordinary losses that become fully deductible up to a reasonably high limit. Given that valuing these small firms can be cumbersome, these declared values are rarely challenged by tax authorities.

This difference in tax incentives combined with the self-employed business owner's ability to

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<sup>5</sup>Excluding farm businesses.

pay herself in firm shares can lead to underestimation in the following manner. Individuals can hold on to their assets for as long as they want without having any binding timeframe that requires them to cash in their stocks. As such, all firm owners have the incentive to pay themselves in shares and declare a low value of the firm, therefore minimizing the current amount of income tax paid on earnings. The firm can then appreciate in the future, and the self-employed individual only has to pay the lower capital gains tax on the appreciated amount.

In addition to the use of undervalued stocks, business owners may also receive income through dividends, interest, annuities, rents and royalties. These various different forms of income are also known as investment incomes and are not imputed into a business owner's salary income. To the extent that these alternative forms of compensation are not confidently identified as business income in the PSID, or any survey data for that matter, we will err on the side of underestimation when evaluating the returns to entrepreneurship.

Note that the premise here is different from that on tax evasion. Having access to different compensation mechanisms is independent of whether or not individuals deliberately underreport earnings. In fact, much of the income discussed in this section is indeed reported on tax returns, but not in a way that shows up as easily as self-employment income. Particularly, if the firm incorporates, then much of the return can take the form of dividends and capital gains. Regardless, the firm has the ability and incentive to pay rent or royalties to their employees and founders rather than wages. Once again, any income statistic we observe may be an underestimate. If an individual cannot be tracked for a long enough time and/or we cannot with confidence parse out the origin of their non-wage income, as empirical researchers we may never fully observe and correctly classify these additional avenues for financial gains. Most datasets, even long panel surveys like the PSID may not track individuals for a sufficiently large number of years to enable us to qualify all financial gains from self-employment as such. Furthermore asset returns in this dataset are for the most part agglomerated across all sources, be it business or personal assets. Since we may not be able to confidently identify the provenance of the income source, it then becomes difficult to consider these returns as business income.

### **1.1.3 Reclassification of employment type**

A third source of mis-measurement emerges when firms that perform particularly well, get bought out, merge with other firms, or become publicly listed. When this happens, the successful entrepreneurs who founded these firms may no longer appear in the data as self-employed. Instead they take on job titles such as CEO's, directors or become board members. This results in them being reclassified as wage-employed in the data after some time. When evaluating the longer

term returns to self-employment, this could lead to underestimation since the most successful self-employed individuals are those who are most likely to be reclassified as wage-employees so as to ensure accountability to either shareholders, or firm partners. Some entrepreneurs may even choose to retire (or receive a “golden parachute” if bought out) upon realizing high levels of success. Whether an individual is reclassified as wage-employed or retires as a result of entrepreneurial success, the financial return they reap will be missed in the empirics, especially if a lump sum payout occurs upon the sale or public listing of the firm at which point these individuals no longer appear as self-employed in the data. While this may not impact the vast majority of small businesses, the omitted financial returns may be sufficiently high such that not accounting for this will unduly downward bias the returns to entrepreneurship.

#### **1.1.4 Human Capital Accumulation**

A fourth issue to consider when using observed income in self-employment to measure the returns to entrepreneurship is that these returns do not necessarily have to show up only in those periods when an individual is self-employed. It is conceivable that individuals gain some skills when they run their own business even if the venture eventually fails. Wage-workers are generally subject to performing specific tasks while the self-employed, in order to run all aspects of their businesses have to multi-task. Scenario 1: Take an accountant working for a wage at a firm who only needs to have expertise in the specific tasks she is required to perform. When this same individual owns her own accounting business instead, she has to acquire (or is at least exposed to) the various different managerial and organizational skills that are necessary to run the firm. Even if the business were to go bust, the individual is still in possession of the multi-faceted skills she had picked up. As such, the wage-employee who attempts entrepreneurial activity becomes a “jack-of-all-trades” (Lazear, 2004). Upon returning to wage-employment, these new skills in addition to those she originally had could cause her marginal productivity to be different, presumably higher all else equal. Scenario 2: In this case individuals may already possess multi-faceted capabilities and enter self-employment simply to signal to future employers that they are able to or are at least familiar with managing a business which will hopefully alter their wage path.<sup>6</sup> This effect changes the true return to self-employment to a more lasting one that survives beyond one’s tenure in self-employment. This argument is akin to that of investment in education so as to boost future employment returns. If in fact this is the case, and ever having entered self-employment influences future wage outcomes positively then one need not be much less risk averse to justify entry into self-employment.

The PSID tracks individuals for a sufficiently long period of time such that the impact of self-

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<sup>6</sup>See Landier (2005) for a discussion on how this signal differs across countries.



employment on their post self-employment wage outcomes can be assessed. Given that 20 percent of individuals enter self employment at some point,<sup>7</sup> most of whom then leave within 3 years, it stands to reason that some human capital could be accumulated in the process.

### 1.1.5 Using Consumption

The estimation strategy I propose involves using consumption instead of reported income to capture the financial returns to self-employment. While income suffers from the various problems described above, using consumption to a large degree circumvents these issues. There is no incentive for individuals to systematically mis-report consumption, particularly for survey purposes. Income on the other hand is more likely to simply reflect the returns reported for tax purposes, and as explained above, these incentives align with underreporting. Furthermore, if any of the less immediate financial gains are anticipated, they will manifest in current consumption. Given that business returns are rarely realised instantaneously, using consumption, a measure that captures expected future earnings as well, will provide a more accurate assessment of the returns to self-employment.

Having said this, one has to be careful with the interpretation of observed outcomes when using consumption. Particularly, one must be cautious in the way in which returns are attributed to self-employment when consumption is the surrogate for financial returns. When an individual decides to start her own business, she may face credit constraints. These constraints could lead to low initial consumption as she cuts current consumption so as to finance the venture, and then subsequently to growth in consumption as these constraints are relieved when the business grows. Another concern arises precisely as a byproduct of tax incentives. Individuals may decide to take advantage of the deductibility of consumption goods which could potentially lead to an increased level of consumption in self-employment.

The PSID contains information on savings and debt, which can be used to address the issue on credit constraints.<sup>8</sup> Identifying the retiming of consumption is however much trickier. For now, the results should be interpreted bearing in mind this possibility.

## 2 Data

This section provides a description of both the cross sectional and longitudinal environment of self-employment. I use data from the Panel Study of Income Dynamics (PSID) to address each of my

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<sup>7</sup>Refer to section 2 for evidence from the PSID.

<sup>8</sup>The findings will be discussed in future versions.

hypotheses. The PSID is a dynamic longitudinal database that tracks a nationally representative sample of individuals and families across time from 1968 - 2010. Between 1968 and 1996, surveys were conducted annually and then biennially after. This dataset contains vast amounts of economic and demographic data, and detailed information on income sources and amounts, employment, family composition changes, and residential location. The longitudinal nature of the data and the availability of a wide variety and quantity of income and employment information renders this dataset ideal for addressing the hypotheses outlined below. The unit of observation for wage and employment variables is at the individual level. Specifically the current analysis only uses household heads since the data on employment and income variables are far more detailed, and therefore useful, for this subset of individuals. Consumption is measured at the household level since this is the level at which it is available for most of the panel.<sup>9</sup> In this paper, I limit the study to household heads<sup>10</sup> between the ages of 18 and 62<sup>11</sup> who are not employed in agriculture or mining<sup>12</sup>. Individuals are classified as being “self-employed” if they report only working for themselves in any given period.<sup>13</sup>

## 2.1 Summary Statistics

The final sample of interest includes 23142 unique individuals of whom 4261 have ever been self employed. Each individual appears in the data for an average of 17 years. About 19 percent of the sample has engaged in self-employment at some point in the course of being surveyed by the PSID. These individuals spend on average 6 years in self employment with the majority appearing as self-employed for 3 years or less. About 11 percent of these individuals who have ever been self employed<sup>14</sup> remain in self-employment for 10 years or more.

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<sup>9</sup>In studying occupational choice with respect to tolerance towards risk, [Rosen and Willen \(2002\)](#) find using the PSID that results don't change substantively when using the income of just the household head versus that of the entire family, showing that results are not very sensitive to changes in the definition of income.

<sup>10</sup>I include both male and female heads.

<sup>11</sup>Sixty two is the minimum retirement age at which individuals can draw on social security, which may alter their behavior, particularly with regards the decision to be self-employed.

<sup>12</sup>Since these two industries face too many outside government incentives, these individuals may not be representative of the true decision making process.

<sup>13</sup>In the analysis thus far, I do not treat individuals who report being both self and wage employed specially. Thus, in comparing wage and self-employment these individuals are treated as if they are wage-employed. I.e. in regressions, when the self-employed take on a dummy value of 1, both the wage-employed and the wage and self-employed take on values of 0. Slightly over 1 percent of observations enter this category and 5 percent of individuals have ever been in this category. Therefore, their behaviors could enter significantly and I will account for the behaviors of this subset in future versions of this paper.

<sup>14</sup>i.e. of the 19 percent who ever try self-employment. This amounts to 470 individuals.

### 2.1.1 Description of the cross section

Table 1 provides some productivity and demographic characteristics describing the cross sectional environment of self versus wage employment in both 1984 and 2005. The characteristics displayed are very similar to those found in Hamilton 2000<sup>15</sup> Specifically, the self-employed have a higher average level of potential labor market experience,<sup>16</sup> more likely to be white and more likely to be married than wage-employees. A few aspects to note comparing data from 2005 and 1984, are that<sup>17</sup> the self-employed are no longer better educated than the wage employed, the proportion of women and non-white individuals in self-employment has increased and finally, job tenures across all employment types have decreased.<sup>18</sup> This indicates that the nature of self-employment and the demographic it appeals to has changed over time.

### 2.1.2 Description of the panel

The longitudinal characteristics of the self-employed have been less thoroughly explored in the literature due to the lack of data. Here, I provide some summary statistics that describe self-employment in a panel setting. Table 2 provides the same productivity and demographic characteristics as those in table 1, but this time for individuals who have ever attempted self-employment, and compares this to those who have never entered self-employment but have appeared as wage workers. Recall that close to 20 percent of the sample ever attempts self-employment while only about 10 percent are self-employed at any given time. The data shows that individuals who ever become self-employed are more likely to be white, married and male. The education and experience differentials that are observed in the cross section no longer appear. The difference in education observed in the cross section but not the panel implies that, of all individuals to try self-employment, the better educated ones are those who persist. The same logic applies for experience. These two observations loosely indicate that entrepreneurial success, at least in terms of survival, are positively correlated with both education and experience.<sup>19</sup>

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<sup>15</sup>Particularly, comparing the summary statistics from the PSID in 1984 yields very similar averages to those in Hamilton 2000. This is intended to show that results are not data driven since both datasets, the SIPP, which Hamilton uses and the PSID used in this paper, display very similar characteristics.

<sup>16</sup>This could simply imply that they are older on average since experience is constructed as the difference between age and years of schooling.

<sup>17</sup>Compare the 2005 summary statistics to the 1984 summary statistics in Table 1

<sup>18</sup>This comes as no surprise; it is commonly known that people switch jobs more frequently now than they did in the past.

<sup>19</sup>This does not come as a huge surprise, especially given what we know about traditional determinants of success in the labor market. However, entrepreneurs are often viewed as a different class of labor market participant, and these observations indicate that at least on these two margins, standard determinants of labor market success do apply. However, this also shows that individuals across the spectrum of demographic characteristics are willing to make the

Table 3 provides a breakdown of time spent in self-employment for those who ever make the attempt. A majority of the sample (68 percent) spends three years or less in self employment, while 25 percent spend five years or more and 11 percent spend over 10 years in self-employment. Other notable features<sup>20</sup> are that individuals who have ever been self-employed hold a larger number of jobs (5.3 vs 3.8) over their tenure in the PSID than those who have only ever tried wage-employment. The self-employed also report working a higher number of hours on average than the wage-employed; 2312 hours versus 2010 hours annually.<sup>21</sup>

Table 4 describes the transition probabilities, thus showing the dynamics that govern entry into and exit out of self-employment. Individuals who are wage-employed in any given period are the least likely to enter self employment the next period, with a transition probability of 2.28 percent. Individuals who are either unemployed or not in the labor force have a 3.3 percent likelihood of engaging in self-employment in the following period, while individuals who are already self employed have a 73 percent probability of staying on. Those individuals who are both simultaneously self and wage employed in a given period have a 26 percent likelihood of moving fully into self-employment in the next period.

### 2.1.3 Re-establishing the puzzle with the PSID data

Figure 1 below provides a graphical depiction of the puzzle that motivates this paper. This figure shows the distribution of hourly wages for the wage and self-employed. Note that the self-employment wage distribution is centered to the left of that for wage-employment and is more positively skewed. Using a Kolmogorov-Smirnov test for the differences in the distributions, I find that the self-employment hourly earnings distribution is significantly different (smaller) at the 1 percent level than that for the wage-employed. This figure re-establishes the puzzle that majority of those in self-employment earn less than what would seemingly be the available alternative in wage employment.<sup>22</sup>

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attempt.

<sup>20</sup>These are not included in tables.

<sup>21</sup>This is 45 hours for the self-employed vs 38.5 hours for the wage-employed weekly.

<sup>22</sup>I do not include the graphs depicting the distribution of returns across the two employment types for 2005, but a very similar pattern is observed and this difference is also statistically significant at the 1 percent level.

## 3 Empirical estimations and results

### 3.1 Estimating the returns to self-employment using consumption

The hypothesis on tax evasion and different forms of income described in 1.1 implies that we have to look to avenues other than reported earnings, or even firm profit for that matter, to be able to document the financial returns to self-employment. I propose using consumption instead of reported earnings to evaluate these returns. I justify the use of consumption as a reflection of current income since according to the permanent income hypothesis, current consumption is a reflection of contemporaneous income and expected future income ( Friedman (1957), Hall (1978)). New information about future incomes that arise during entry into self-employment shows up both as unexpected changes in income and consumption. The change in consumption should theoretically equal some fraction of the present value of the change in future income, and will be equal to the change in current income only when this change is permanent. Therefore, measurement aside, income and consumption measure the same thing, but in different ways.<sup>23</sup> With regards to survey reporting, it is fairly reasonable to assume that methods used to underreport income for tax purposes will lead to an underreporting for purposes of the survey. There is however no such incentive to underreport consumption in the survey.<sup>24 25</sup> Therefore, the distinction between the two is based on measurement per se.

In light of hypothesis 1.1 what should we expect to empirically observe? In the absence of credit constraints,<sup>26</sup> and only accounting for unobservable income sources, we expect to see the income difference between the wage and the self employed shrink when using consumption rather than income. Specifically, given that individuals have to sink some of their own wealth into their personal businesses, we could in effect see an initial dip in consumption upon entry into self-employment and then a faster growth rate in consumption that follows. Furthermore, in each year while self-employed, one learns that one's business hasn't failed, leading to positive news and an

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<sup>23</sup>One qualification: if the loss in income during self employment was anticipated, then consumption was already lower prior to self-employment, and remains lower on entry to self-employment even though earnings in fact fall with self-employment. The two measure the same thing only if entry into self-employment was unanticipated, occurring in response to some flash of insight about a potential new business.

<sup>24</sup>Issues of recall may be an issue, but so long as this isn't a systematic problem amongst the self-employed in a way that is different from that for the wage-employed, this is not of great concern.

<sup>25</sup>However, there still exists the possibility that consumption for the self-employed may occur in part through business expenses. For example, transport charges, food consumed during work hours, conferences in resorts etc are not reported as personal expenses, but rather as business expenses. This then leads to an understatement of consumption for the self-employed.

<sup>26</sup>Or rather, in the absence of extreme credit constraints such that business owners can only draw on savings and current earnings rather than being able to access some of the expected future returns. However, even so, if you expect your venture to succeed, you may be willing to fully dis-save in anticipation of the high future returns.

increase in consumption.

### 3.1.1 Estimation Strategy

Regression 1: Regression to estimate the impact of being self-employed on reported income.

$$\log(I_{it}) = A_i + B_t + \beta_1 SE_{it} + \beta_2 TimeSE_{it} * SE_{it} + \beta_3 X_{it} + \epsilon_{it} \quad (1)$$

where,

$I_{i,t}$  is a measure of financial income which could be hourly wage, yearly labor income etc for individual  $i$  at time  $t$ .  $SE_{i,t}$  is a dummy that takes on the value 1 if individual  $i$  is self employed at time  $t$ ,  $TimeSE_{i,t} * SE_{i,t}$  is the interaction between being in self-employment and current tenure in self-employment and  $X_{i,t}$  are controls for experience, experience squared, education, race, marital status, spouse income and family composition. This regression can be run both on the entire dataset interpreting results as that from a cross section, and accounting for individual fixed effects.

Regression 2: Regression to estimate the impact of being self-employed on observed consumption.

$$\log(C_{it}) = A_i + B_t + \gamma_1 SE_{it} + \gamma_2 TimeSE_{it} * SE_{it} + \gamma_3 X_{it} + u_{it} \quad (2)$$

where the only difference is the dependent variable, which in this case is  $C_{it}$ , consumption. Once again, this regression can be run both on the entire dataset interpreting results as that from a cross section, and accounting for individual fixed effects.

The PSID provides a very limited number of variables to measure consumption. Data on consumption is more complete from 1999 onward. However, only a few variables, such as food consumption at home and away, rent, imputed rent, utilities and vehicle purchases are available for the majority of the dataset. In order to exploit the maximal number of years possible, I measure consumption a la [Skinner \(1987\)](#), where consumption is a linear combination of food expenditures (at home and away), rent, utilities, vehicle purchases and housing value. In his paper, these inputs explain over 70 percent of variation in consumption. In his 1987 piece, Skinner provides a simple technique to assign a measure of total consumption to households using the limited available consumption components in the PSID. He regresses the different components from the PSID on total consumption from the Consumer Expenditure Surveys (CEX) and estimates weights that allow the variables available in the PSID to predict true total consumption. These estimates are stable over time and explain up to 78 percent of the total variance in consumption. [Guo \(2010\)](#) repeats Skinner's exercise for the years 1980 - 2003 and finds that the original variables continue

to be relevant. In addition he finds that more than 80 percent of the variance in total non-durable consumption is sufficiently explained by three expenditure components (food, utilities, and transportation), and that the estimated coefficients as well as predicative power are highly stable for this period.<sup>27</sup> In this paper I use the most generalized version of consumption that would enable me to have the largest number of observations. This measure of consumption includes the value of food eaten at home and away, rent and imputed rent. I also perform robustness checks using various combinations, from the most basic measure of consumption, food expenses, to all other combinations proposed in Skinner (1987) that include utilities and vehicle purchases.

The  $\beta_1$  coefficient in equation 1 is interpreted as the percent difference in earned income when self-employed as compared to that in wage employment, while the  $\gamma_1$  coefficient in equation 2 is interpreted as the percent difference in consumption in self-employment versus wage employment. When estimated using fixed effects, the difference between these two coefficients,  $\beta_1$  and  $\gamma_1$  shows the extent of the discrepancy between reported earnings and true financial well being as reflected by consumption. In interpreting these coefficients, one should bear in mind that there will be selection on various margins, both positive and negative that determine who leaves and who stays on in self-employment.

These tests are run on both the pooled sample and controlling for individual fixed-effects.

### 3.1.2 Exploiting consumption further

Using consumption not only resolves the immediate issues that arise as a result of inaccurate reporting, and difficulties in identifying wage sources for the self-employed. In looking at long run changes in consumption following initial entry, many of the less immediate returns to self-employment can be captured. For example, when one becomes reclassified due to entrepreneurial success as described in 1.1.3, even if these returns are realised after the event, consumption ex-post reclassification should reflect these increases. In the same vein, human capital accumulation should also be reflected in changes in consumption after initial entry into self-employment. One could also argue that the marginal cost of consumption in self-employment is lower since there is ample room to reclassify consumption as deductible business expenses and pay less taxes, in effect inducing the retiming of consumption to periods in self-employment. Assuming that these business expenses are nonetheless reported as consumption, these dynamics will also be captured by accounting for all future periods and not just the periods spent in self-employment.

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<sup>27</sup>This version of the results uses Skinner's 1987 weights for the entire dataset. In future versions, I will use Guo's updated weights for each individual year so as to ensure that the results are robust to changes in weights across time. Guo's measure takes out the durable goods that suffer from being lumpy in terms of entering expenditures, and only focuses on the non-durables.

The estimation strategy described below will capture the aggregate impact of all the possible longer term implications of self-employment including those described above:

$$\log(C_{it}) = A_i + B_t + \phi_1 ASE_{it} + \phi_2 X_{it} + v_{it} \quad (3)$$

where ASE is a dummy variable that takes on the value 1 in all periods after initial entry into self-employment. The coefficient  $\phi_1$  aggregates the impact of ever having entered self employment including those periods in self-employment and those periods after.

### 3.1.3 Results

The intuition of the findings are nicely conveyed by comparing the distributions presented in figures 1 and 2. The earnings distribution for the self-employed is to the left of that for the wage employed (albeit more positively skewed), while the consumption distribution for the self-employed is to the right of that for the wage employed. The self-employed and wage-employed distributions are significantly different for both income and consumption. In performing a Kolmogorov Smirnov test for the difference in distributions, I find that the wage employment distribution of earnings is significantly different and greater than that of the self-employed, while the self-employment distribution of consumption is significantly different and greater than that of the wage-employed.<sup>28</sup>

Table 5 reports results for the regressions using hourly wage as the dependent variable, while table 6 reports results for the regressions which use consumption as the dependent variable. In a fixed effect setting I confirm Hamilton's finding that the self-employed earn less than the wage employed. Specifically, controlling for unobserved individual characteristics and using reported wages as the measure of financial returns I find that individuals earn 27 percent less in self-employment than they do in wage employment. When I use consumption instead of income, I find that the self-employed consume 5 percent more in self-employment than in wage-employment. These results are highly significant, both economically and statistically (at the 1 percent level).<sup>29</sup> Comparing the results from these two tables resolves the enigma surrounding the decision that the self-employed make to remain so.

These results also provide more insight into self-employment returns than simply pointing out

<sup>28</sup>Significance is measured at the 1 percent level.

<sup>29</sup>In comparing regressions from tables 5 and 6, one will notice that the latter has substantially fewer observations. This is due to the addition of spouse's wage in the consumption regressions. Controlling for spouse's income is intended to avoid one possible source of overestimation since spouses may work more in times when the business is doing badly. Another motivation for including spouse's income is that high spouse income could compensate for low self-employment income in general, and it is this which enables the increased household consumption. Therefore, to ensure that this isn't driving any of the results, I include spouse's wage in column 4 of table 5. I find that the results don't change.



that they are higher. Referring to column 3 in table 6 I find that consumption in self-employment per se is not statistically different, but with each additional year of being self-employed, individuals consume 1.14 percent more, implying that in the 10th year of self-employment, one consumes over 11 percent more. If we were to simply look at reported income, we would believe that this same individual is financially worse off, earning 28 percent less.<sup>30</sup> The finding that consumption doesn't drop initially provides evidence that individuals are either eating into their savings when they start off in self-employment or that they have access to liquidity. This is particularly interesting since we would expect that they sink some capital into the business at least initially and therefore forgo some consumption early on. Robustness checks in table 7 show that the results persist across different definitions of consumption.<sup>31</sup> This finding indicates that we can no longer underestimate the importance of financial returns when evaluating an individual's choice to become and remain self-employed.

In comparing the OLS and FE coefficients (column 4 vs column 3 of table 6) it is clear that wealth is a determinant of entry into self-employment. The self-employed consume 6 percent more controlling for tenure, and with each additional year consume 1.5 percent more. Column 2 of table 6 shows that those who stay in self-employment longer altogether also consume more. The coefficients on "current tenure in SE" and "total tenure in SE"<sup>32</sup> are both positive and significant in the consumption regressions. Including either of these terms results in the insignificance of the self-employment dummy. This says that the gains from self-employment generally accrue over time in self-employment and that the returns to remaining self-employed increase in time (conditional on realizing that your venture will succeed, which over 60 percent of individuals find is not the case, since we observe that they leave within 3 years).

Given that the consumption bundle used comprises fairly rudimentary goods (albeit weighted to be representative of total consumption), it can be argued that these estimates if anything provide a lower bound for the true consumption difference since we are not including any luxury goods.<sup>33</sup>

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<sup>30</sup>This finding in the wage regressions, that self-employment earnings do not increase with tenure implies that individuals increasingly hide income with time in self-employment seeing how their consumption is growing.

<sup>31</sup>In the case where I just use the simple sum of food consumed at home and away, the result is not significant, even at the 10 percent level. However, the coefficient is still positive and economically significant and just barely fails the significance test (p-value of 0.15).

<sup>32</sup>"Current tenure in SE" refers to the current year in self-employment i.e. in the first year this takes on a value of 1, in the second year 2 and so on. "Total tenure in SE" refers to the total number of years an individual spends in self-employment while in the sample interacted with being self-employed.

<sup>33</sup>However, this requires that the self-employed are not giving up standard goods that come bundled with most types of wage-employment such as insurance and pension plans, which is not clear. If anything it would seem that these two items would be more likely bundled in wage employment. Another possibility is that the self-employed even prior to becoming so have different preferences and value more immediate consumption goods higher than less tangible goods like pension plans and insurance that generally come with wage-employment. If this were the case, I would

### 3.1.4 Mechanically linking income and consumption

Given the findings above, what then can we take from any income statistic for the self-employed? Is it simply noise? Or can we at least tell that reporting a higher income is meaningful in terms of indicating success? The regressions in table 8 show that higher reported income for the self-employed correlates positively with higher consumption. This implies that the ordinality of reported income generally corresponds with entrepreneurial success since this is reflected in consumption. The coefficient on the variable of interest, “Annual Income” is interpreted as the elasticity of consumption with respect to income since both income and consumption are log transformed. Columns 1 and 3 run fixed effects estimations on just the self-employed while columns 2 and 4 show results for the wage-employed. A 1 percent change in income for the self-employed corresponds to a 0.06 percent change in consumption, while a 1 percent change in income for the wage employed corresponds to a 0.1 percentage change in consumption. This says that consumption is more responsive to reported income for the wage-employed. This coefficient should not be interpreted too seriously. For one, elasticity is defined at a point and given income underreporting, it is unclear how much less elastic consumption is to income for the self-employed.<sup>34</sup> In addition, the correlation between consumption and wage depends on the degree to which fluctuations in wage reflect permanent versus transitory changes. If fluctuations are completely transitory, then the correlation should be zero, whereas this should be one if they are permanent. It is reasonable to assume that self-employment income can have more transitory shocks and that this is what is being picked up.

The take home from this portion should simply be that the income statistic observed for the self-employed is not completely ad-hoc and that those individuals who do better report earning more.

### 3.1.5 Variance of consumption

While showing that mean consumption is higher in self-employment makes some sense of the decision to enter into self-employment, this still says nothing about the true returns we care about; that of individual welfare and utility. If individuals are risk averse and the variance in consumption is higher, then it is not clear that individuals are better off being self-employed. This section of the

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be over-estimating the impact that self-employment has on consumption. Rather, I would just be able to show that given these differing preferences, the self-employed are better off since they are able to now consume more of what they weight heavily, rather than more of everything. In order to be able to clearly document the differences in the components of consumption that differ between the wage and self employed, I will exploit the Consumer Expenditure Survey (CEX) in future versions.

<sup>34</sup>Many factors will influence the interpretation. The shape of the engel curve, whether this is the same for the wage and self-employed and the extent of underreporting, i.e. is the observation of a \$1 actually representative of a \$1.50? The degree of responsiveness for the self-employed depends on the degree of mis-reporting.

paper looks at how the variance of consumption differs for the self-employed and whether this is resolved with time in self-employment. The estimation involves regressing the squared residuals from the original consumption regression on self-employment, time in self-employment and other controls. Specifically, I use the residuals obtained from equation 2 to estimate the conditional heteroskedasticity with the following specification:

$$u_{it}^2 = A_i + B_t + \theta_1 SE_{it} + \theta_2 SE_{it}/Tenure_{it} + \theta_3 X_{it} + \eta_{it} \quad (4)$$

where  $u_{it}^2$  is the squared residual obtained from the estimation in equation 2 and  $SE_{it}/Tenure_{it}$  is intended to capture the resolution of variance with time in self-employment.

The results from table 9 show that being in self-employment does not significantly impact the variance of consumption. The coefficients of interest are not significant even at the 10 percent level. Once again however, it should be noted that this difference is only identified off those who have switched from wage to self employment at some point. Given that majority of these individuals only stay in self-employment for under three years, they could simply be consumption smoothing by reallocating their savings to avoid any unpleasant changes in consumption. However, despite the statistical insignificance, the result in column 2 of table 9 reveals a positive coefficient in the earlier years of self-employment and a resolution of this risk over time. These interpretations of the results are to be taken with a grain of salt due to the lack of significance. Regardless, the results indicate that the self-employed do not suffer from a greater degree of unpredictability in consumption. This observation combined with the previous finding that the self-employed consume more alludes to the fact that they in fact are better off, not just in terms of average financial returns, but in utility terms as well.

### 3.1.6 Hours worked and total labor income

Another issue to consider is that of using hourly wage as the unit of measurement. The marginal return to each extra hour worked in self-employment can be very different than the average return, especially at different stages of the firm's development. Furthermore, the ultimate objective is to evaluate if utility is higher in self-employment. If in self-employment, financial returns are lower and hours worked are higher, then we have evidence that utility is certainly lower.<sup>35</sup> On the other hand, if both the hours worked and the financial returns are less in self-employment, it then becomes less clear as to how this impacts utility. Low hours could either be a response to the low marginal wage rate or a reflection of one's preference for flexibility. A third possibility is that

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<sup>35</sup>Unless of course the non-pecuniary returns are so high that this is compensated for.

hours worked are higher and financial returns are higher. Here, individuals could be working more because the cost of forgone leisure is lower or because the marginal wage rate is higher. Again, the implications for well-being are unclear.

Regardless, it is vital to at least understand which of the three possibilities holds empirically, before we can proceed to evaluate the returns to self-employment.

Instead of using hourly wage as is commonly used, here I use total annual labor income so as to account for the possibility that returns in self employment are not linear in hours worked. The regression results in table 11 show that the total labor income of the self-employed is in fact underestimated by the hourly wage, implying in turn that the hours worked by the self-employed are greater. The regressions show that the self employed earn 21 percent less when I use annual labor income versus 27 percent less when I use hourly wage. Furthermore, tenure in self-employment enters positively and significantly indicating that annual income increases with each extra year in self employment, while hourly wage hardly changes.

These observations naturally lead to looking at the differences in the hours worked by the self-employed. Table 12 provides the estimation results of the specification below:

$$Hours_{it} = A_i + B_t + \delta_1 SE_{it} + \delta_2 TimeSE_{it} * SE_{it} + \delta_3 X_{it} + \nu_{it} \quad (5)$$

where  $Hours_{it}$  measures annual hours worked by individual  $i$  at time  $t$ .

The fixed effects regressions show that individuals work on average 137.7 hours more per year in self-employment. The second column of table 11 shows that individuals who stay in self-employment longer (i.e. overall time spent in self-employment), work more. Column 3 provides no evidence that the hours worked decreases with each additional year in self-employment. A couple of interesting insights from these results are firstly, it seems that in order to succeed as an entrepreneur, one has to be more hardworking.<sup>36</sup> Secondly, this provides some evidence that there do exist non pecuniary returns to self-employment since this would imply they work between 6 and 7 percent more per annum. Therefore the returns to self employment not only include higher financial returns, but possibly also added non-pecuniary benefits.

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<sup>36</sup>One caveat is that it is possible that those who do better think they work more and hence report higher hours. In fact, for the most part, the self-employed have full discretion in determining what constitutes a work hour. The results should be interpreted bearing this in mind.

## 3.2 The self-employed before and after entry

All the findings so far can be made more meaningful by understanding how these self-employed individuals looked before entering and how they look after they leave.<sup>37</sup> Table 10 describes the consumption patterns of the self-employed before they enter self-employment, after they enter self-employment and after they leave self-employment having entered at least once. The OLS regression in the first column shows that individuals who ever enter self-employment consume 2 percent more even before doing so. This finding is consistent with the conventional wisdom, that the self-employed are wealthier. The OLS result in the second column shows that individuals on average consume 7 percent more in all periods after ever having entered self-employment. This includes periods in self-employment and periods after that if and when individuals choose to leave. This can be contrasted to the OLS results from the consumption regressions in columns 3 and 4 of table 7. Individuals while in self-employment consume approximately 15 percent more, while as shown in table 10 including all the periods beyond just those in self-employment attenuates this effect by half. This indicates that only those individuals who are particularly successful choose to stay on in self-employment. Thus providing further evidence that the financial gains from self-employment do motivate individuals to stay on. The fixed effects regressions in table 10 indicate that on the whole including all periods after ever entering self-employment individuals do not display any significant difference in consumption before or after self-employment. This is most likely driven by the fact that most people who enter self-employment stay for under three years and that they are probably just consuming from savings, unless they succeed and remain self-employed for a longer period of time. The finding that there is no increase in consumption for those who return to wage work indicates that on average, those who do well in self-employment stay on, thus concentrating the positive returns from self-employment amongst those who remain so.

### 3.2.1 Reclassification

[This is yet to be thoroughly estimated]

Estimation strategy:

A simple way to estimate the prevalence of reclassification would be to look at how the odds of leaving self-employment changes with consumption. Intuitively, it would make sense that at

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<sup>37</sup>Refer to section 3.1.2 for the discussion.

very low levels of consumption, the probability of leaving self-employment is higher and that this decreases as consumption in self-employment increases. Evidence from the previous regressions provides support for this intuition, at least on average. If in fact, however, individuals who do particularly well get bought out or reclassified, then we should see this probability of leaving self-employment increase beyond some high level of consumption.

Some very preliminary evidence corroborating this hypothesis is provided in figure 4. This graph shows the probability of leaving self-employment as a function of the residuals from the consumption regressions described in equation 2. The graph<sup>38</sup> indicates that once the consumption residual is high enough, the probability of leaving self-employment increases. The confidence intervals are particularly large due to the small number of observations that the right side of this trend is being identified off.

To estimate the prevalence of reclassification more precisely, I propose employing the estimation strategy below:

Stage 1: Save residuals from the regression described in equation 2

Stage 2: A piecewise linear regression for different ranges of  $\hat{u}_{it}$

$$Leave_{it} = \lambda_0 + \lambda_1 \hat{u}_{it} + \lambda_2 X_{it} + v_{it} \quad (6)$$

### 3.3 Summary of findings

To summarize, I find that the consumption levels of those who stay on in self-employment are significantly higher and grow at a reasonable rate yearly. The variance in consumption does not change, but the hours worked are higher in self-employment. To capture the net return to self-employment I also account for the so-called “failures” who leave self-employment soon after entry by including all future time periods after initial entry into self-employment. I find that expected consumption here is unchanged. Given these findings, the overall impact of self-employment on utility remains unclear.

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<sup>38</sup>This graph performs a local polynomial smoothing over different ranges of the residuals from the consumption regression. This is achieved by running local regressions of the binary outcome, staying or leaving self-employment over small intervals of the dependent variable, in this case the consumption residual. The coefficients of these peicewise linear estimations are then linked to form a curve.

## 4 Future extensions

This section describes some extensions to the current analysis that will help in better understanding the returns to entrepreneurship.

### 4.1 Other tests for missing income

This dataset can also be used to evaluate the prevalence of other income sources in self-employment. In particular, I could look at the effect of self-employment on income from dividends, interest, royalties and capital gains

### 4.2 Opportunity Costs

If we were to focus on the appropriate subsample of individuals the returns to entrepreneurship may be even higher. Individuals enter into self-employment for different reasons. Some individuals do so involuntarily (loosely speaking this is out of necessity, or at least less voluntarily) while others do so voluntarily. The opportunity cost for “involuntary” entrepreneurs is different than that for “voluntary” entrepreneurs. The returns to self-employment should be contextualized relative to the available outside option rather than just agglomerated for all individuals. If the outside option differs across groups of individuals in a manner that can be identified, then this should be taken into account in such discussions. Individuals who are laid off or fired from their wage jobs do not have access to the same outside option, at least in the immediate to short term, as those who voluntarily leave their wage jobs to pursue an idea in self-employment. We would expect that for the latter group, the average returns are higher and that the necessary level of return to induce retention also are higher.

Essentially, I am trying to identify if there are any systematic differences in the returns to and success probabilities of individuals who are involuntarily versus those who are voluntarily separated. Furthermore, it would also be interesting to look at the minimum threshold income level that induces either group to persist in self-employment.

In the PSID data, individuals are asked why they left their previous place of employment. Responses are categorized as; quit or resigned, laid off or fired, folded or went out of business and other<sup>39</sup>. However, only 50 percent of those who are ever self-employed even report the mode of separation from their previous form of employment. As such, in order to credibly categorize

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<sup>39</sup>This “other” category includes various explanations that are not relevant to the estimation I propose

individuals by mode of separation I could also draw on unemployment insurance receipt as reported in the PSID.

#### 4.2.1 Estimation

Estimation Strategy:

First, I will look at the difference in the length of stay in self-employment across the two different categories. Given that majority of the self-employed are in it for under 3 years, it would be useful to identify if one particular group is more likely to stay on and reap the gains from self-employment. It is not clear that one group would be more likely to persist longer than the other. Individuals who voluntarily enter self-employment presumably do so with a worthy venture in mind and as such are more likely to survive. However, they may also have a more readily accessible outside option in wage-employment and are therefore more likely to leave as well. The involuntarily separated, while perhaps not equipped with as well-planned ventures, may be willing to stay longer since the outside option is less obvious. To estimate this, I can run the following regression:

$$(YearstoExit)_i = A_i + B_t + \beta_1 VolPrev_i + \beta_2 X_{it} + \epsilon_{it} \quad (7)$$

where the dependent variable is the number of years into self employment prior to exiting and the independent variable is a dummy for whether or not an individual entered self-employment voluntarily.

The regression in equation 7 serves to provide some insight on a determinant of length of stay in self-employment and those who comprise the small proportion of self-employment veterans.<sup>40</sup>

Next, I can run the regression described below to test if there is a difference in the financial returns for the voluntarily self-employed.

$$\log(C_{it}) = A_i + B_t + \beta_1 SE + \beta_2 Voluntary * SE_{it} + \beta_3 Tenure + \beta_4 X_{it} + \epsilon_{it} \quad (8)$$

where  $Voluntary * SE$  is the interaction of the dummy variable for being voluntarily separated from wage work with self-employment in the current period.

The coefficient  $\beta_2$  will show if in fact mode of separation is associated with different financial returns controlling for observable characteristics.

Lastly, I could look at whether there is a difference in the return required to induce either type

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<sup>40</sup>As described in the summary statistics, most individuals who ever try self-employment leave within 3 years and only a very small proportion stay on beyond the 10th year.



of entrant to stay on in self-employment. To estimate this, I could look at how the probabilities of leaving self-employment change with consumption, and deviation from consumption prior to entering self-employment, by mode of separation. This will not only provide insight into the financial returns requires to induce retention in self-employment, but it will also provide some insight into the prevalence of non-pecuniary returns in guiding the decision to remain self-employed.

### 4.3 Human Capital Accumulation

This avenue for returns to self-employment is described in section 4.3. The rationale here is that even attempting to run a business, successful or otherwise, could result in the accumulation of some skills that may then show up in future wages once an individual returns to wage-employment.

#### 4.3.1 Estimation

The proposed estimation strategy follows [Bertrand et al. \(2004\)](#):

2 stage method

Stage 1: On full sample

$$W_{it} = A_i + B_t + \psi_1 X_{it} + \nu_{it} \quad (9)$$

Stage 2: For only the “treated ” sample

$$\widehat{\nu}_{it} = \kappa_1 Post_{it} + \kappa_2 Tenure_i + \epsilon_{it} \quad (10)$$

where the “treated” sample refers to the self-employed who return to wage employment and  $Post_{it}$  refers to the periods in wage employment after having first entered self-employment.  $Tenure_i$  refers to the individuals total time spent in self-employment prior to returning to wage employment.

$\kappa_1$  is then interpreted as the impact on wage employment of having ever entered self-employment and  $\kappa_2$  captures the impact of total tenure in self-employment on future wage-employment.

An important thing to note is that this estimation in stage 2 should be run separately for those who are involuntarily versus voluntarily separated. Since the outside option is different, the channels for human capital accumulation (or not) will be different. Alternatively, the possibility exists that trying self-employment may worsen future wage-employment for some, especially if there is stigma associated with being a failed entrepreneur. Once again, it is not theoretically clear which of these effects will dominate, thus further justifying the need for empirical testing.

## 5 Conclusion

This paper sheds some new insight on the returns to self-employment. The literature for many years now has viewed the decision to persist in self-employment as anomalous due to the low returns that are observed for most individuals. This decision has thus far primarily been rationalized using heterogeneity in preferences and beliefs. The main result of this paper shows that this puzzle can be resolved by simply using a better measure of financial returns than reported income. I find that individuals who stay on in self-employment are financially better off and that they consume more with time in self-employment. This explains at least in part the motivations to persist in self-employment. When evaluating the net gains in self-employment for all individuals who ever try and not just those who succeed, I find that consumption is about the same in both wage and self-employment. I also find that the variance in consumption does not change, and that the hours worked annually are significantly higher in self-employment. Combining these findings, the implications of self-employment on overall individual welfare as measured by utility is unclear. The results indicate that while the self-employed are financially better off, they also work more. Higher hours could either reflect more pleasant work, or the need to respond to increasing marginal returns to time spent in self-employment. Given the prior work suggesting that people derive happiness (or less disutility) from their work in self-employment, this then suggests that utility increases due to tastes with no offsetting costs.

In view of the findings of this paper, the original puzzle of why the self-employed choose to remain so despite the lower earnings could perhaps be flipped into one on why more individuals don't enter given the higher returns.

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# Tables and Graphs

Figure 1: Kernel Density Plot of Earnings in 1984

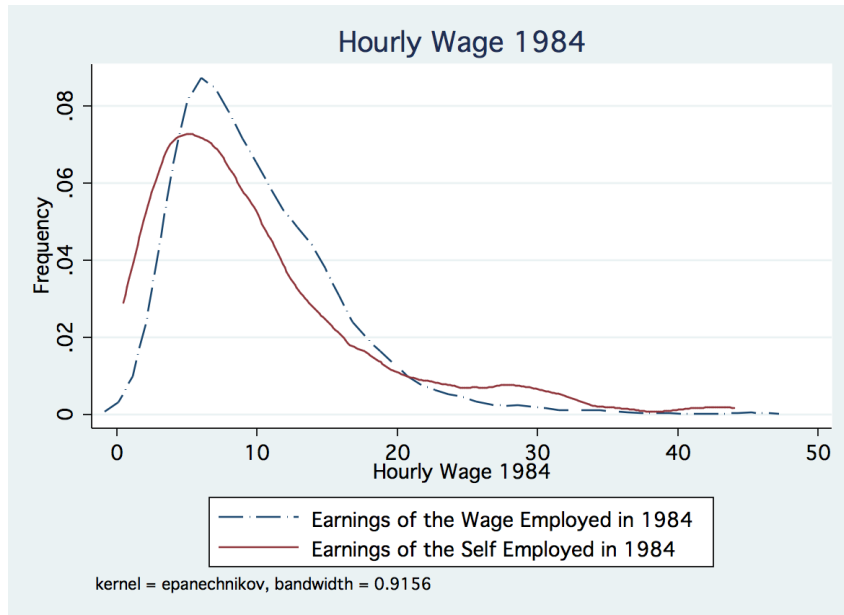


Figure 2: Kernel Density Plot of Consumption in 1984

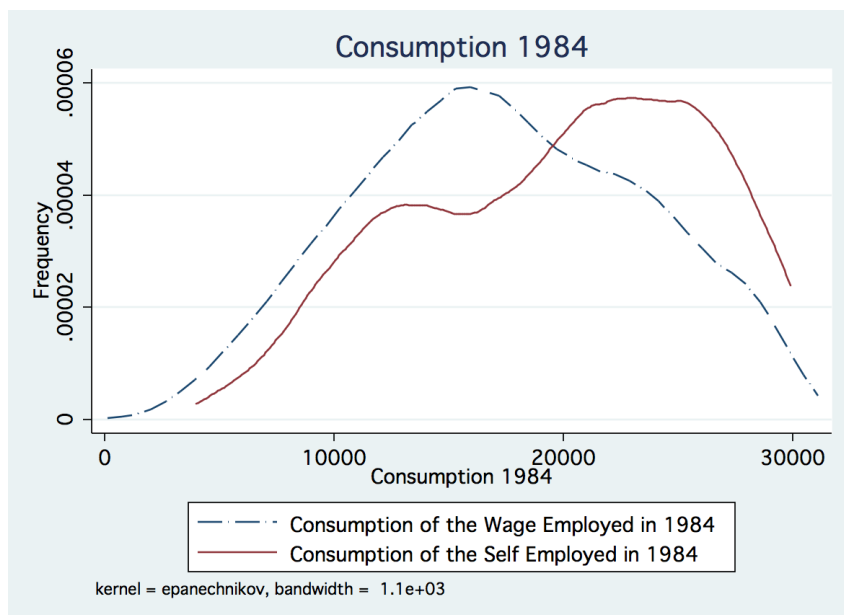


Figure 3: Kernel Density Plot of Annual Earnings in 1984

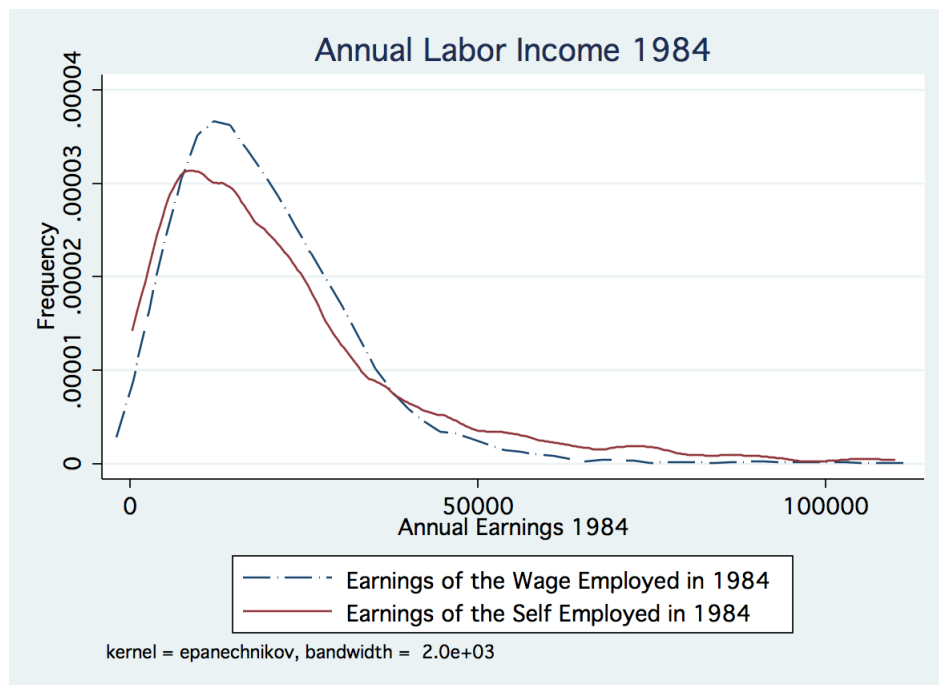


Table 1: Cross Sectional Summary Statistics

	1984 Paid Employees	1984 Self Employed	2005 Paid Employees	2005 Self Employed
Experience	17.46	21.23	20.34	24.15
Tenure	10.90	13.43	5.52	6.58
HS Drop	0.16	0.16	0.10	0.11
HS Grad	0.39	0.30	0.35	0.35
College Drop	0.23	0.23	0.26	0.23
College Grad	0.11	0.16	0.15	0.14
Grad Sch	0.11	0.16	0.08	0.12
Non-White	0.38	0.17	0.45	0.36
Married	0.64	0.79	0.56	0.68
Male	0.77	0.91	0.72	0.84
Observations	4119	432	5654	707

Summary of means in the cross sections, 1984 and 2005

Table 2: Panel Summary Statistics

		Ever attempted self-employment		Never attempted self-employment (but have attempted wage employment)	
		Mean	Std. Dev.	Mean	Std. Dev.
Experience	overall	20.2	11.3	19.0	11.9
	between		11.3		12.2
	within		6.2		5.3
Tenure	overall	9.3	6.9	9.1	6.9
	between		5.1		4.8
	within		2.9		2.4
HS Drop	overall	0.2	0.4	0.2	0.4
	between		0.4		0.4
	within		0.0		0.0
HS Grad	overall	0.3	0.5	0.4	0.5
	between		0.5		0.5
	within		0.0		0.0
College Drop	overall	0.2	0.4	0.2	0.4
	between		0.4		0.4
	within		0.0		0.0
College Grad	overall	0.1	0.3	0.1	0.3
	between		0.3		0.3
	within		0.0		0.0
Grad Sch	overall	0.1	0.3	0.1	0.3
	between		0.3		0.2
	within		0.0		0.0
White	overall	0.7	0.5	0.5	0.5
	between		0.5		0.5
	within		0.0		0.0
Married	overall	0.7	0.5	0.6	0.5
	between		0.4		0.5
	within		0.2		0.2
Male	overall	0.8	0.4	0.7	0.5
	between		0.4		0.5
	within		0.0		0.0

Summary of means. Overall refers to overall means. Between describes the variation across individuals. Within describes the variation within individuals.



Table 3: Summary of time spent in self-employment

Years In Self Employment	Number of individuals	Proportion of Individuals	Overall Frequency	Overall Percentage
1	1794	42.1	17116	31.85
2	683	16.03	7819	14.55
3	434	10.19	5159	9.6
4	291	6.83	3687	6.86
5	173	4.06	2278	4.24
6	150	3.52	2184	4.06
7	98	2.3	1753	3.26
8	94	2.21	1569	2.92
9	74	1.74	1352	2.52
10	47	1.1	845	1.57
11	62	1.46	1172	2.18
12	50	1.17	1113	2.07
13	43	1.01	857	1.59
14	39	0.92	883	1.64
15	47	1.1	1099	2.05
16	29	0.68	670	1.25
17	23	0.54	617	1.15
18	16	0.38	388	0.72
19	20	0.47	506	0.94
20	17	0.4	433	0.81
21	16	0.38	424	0.79
22	10	0.23	261	0.49
23	13	0.31	378	0.7
24	8	0.19	243	0.45
25	6	0.14	185	0.34
26	7	0.16	210	0.39
27	6	0.14	194	0.36
28	5	0.12	152	0.28
29	2	0.05	61	0.11
30	2	0.05	66	0.12
31	1	0.02	31	0.06
33	1	0.02	34	0.06
<b>Total</b>	<b>4261</b>	<b>100</b>	<b>53739</b>	<b>100</b>

Table 4: Transition Probabilities

	Other	Wage	Wage & Self	Self
Other	70.51	25.83	0.34	3.32
Wage	6.51	90.49	0.72	2.28
Wage & Self	4.69	45.55	23.13	26.63
Self	6.59	16.41	3.22	73.78

Probability of going from one category of employment in period t to the next in period t+1.

Table 5: Hourly Wage Regressions

	FE	FE	FE	FE	OLS
	Hourly Wage	Hourly Wage	Hourly Wage	Hourly Wage	Hourly Wage
Self Employed	-0.270*** -0.0147	-0.268*** -0.0215	-0.269*** -0.0167	-0.287*** -0.0229	-0.367*** -0.0138
Current Tenure in SE			-0.0004 -0.0027	-0.0006 -0.0036	0.0128*** -0.0019
Total Tenure in SE		-0.0003 -0.0024			
Experience	0.0248*** -0.0034	0.0248*** -0.0034	0.0248*** -0.0034	0.0185*** -0.0048	0.0400*** -0.0006
Experience Sq	-0.000726*** 0.0000	-0.000726*** 0.0000	-0.000726*** 0.0000	-0.000718*** 0.0000	-0.000661*** 0.0000
HS Dropout					-0.461*** -0.0062
HS Graduate					-0.193*** -0.0047
College Grad					0.243*** -0.0067
Grad Sch					0.337*** -0.0073
Married	0.127*** -0.0093	0.127*** -0.0093	0.127*** -0.0093	0.0595 -0.0749	0.334*** -0.0040
Spouse Wage				0.0513*** -0.0046	
Family Size				0.0145*** -0.0040	
White					0.129*** -0.0090
Black					-0.0708*** -0.0092
Hispanic					-0.114*** -0.0301
Asian					0.103* -0.0605
Constant					1.657*** -0.0144
Observations	114441	114441	114441	51625	114441
R-squared	0.08	0.08	0.08	0.10	0.27
No. Individuals	18887	18887	18887	11238	

Note: Dependent variable is the log of hourly wage in 1990 dollars. All regressions include year dummies. Absolute values of standard errors are in parentheses. All standard errors are heteroskedastic consistent. Omitted education category is college dropouts, and omitted race category is "other". "Current Tenure in SE" is the interaction between current year in self-employment and being self-employed. "Total Tenure in SE" is the interaction between total years spent in SE and being self-employed.

Table 6: Consumption Regressions

	FE Consumption	FE Consumption	FE Consumption	OLS Consumption
Self Employed	0.0498*** -0.0108	0.000612 -0.0177	0.00379 -0.0132	0.0673*** -0.0112
Current Tenure in SE			0.0114*** -0.00238	0.0147*** -0.00151
Total Tenure in SE		0.00596*** -0.00183		
Experience	0.0274*** -0.00503	0.0272*** -0.00502	0.0278*** -0.00503	0.0283*** -0.000805
Experience Sq	-0.000497*** -3.49E-05	-0.000494*** -3.47E-05	-0.000507*** -3.49E-05	-0.000416*** -1.79E-05
HS Dropout				-0.230*** -0.00746
HS Graduate				-0.120*** -0.00524
College Grad				0.132*** -0.00698
Grad Sch				0.147*** -0.00722
Married	0.233 -0.203	0.227 -0.204	0.227 -0.202	0.169 -0.113
Spouse Wage	0.0368*** -0.00401	0.0369*** -0.00401	0.0372*** -0.00401	0.176*** -0.00372
Family Size	0.0655*** -0.00312	0.0654*** -0.00312	0.0654*** -0.0031	0.0573*** -0.00177
White				-0.0497*** -0.0106
Black				-0.242*** -0.0113
Hispanic				-0.0500* -0.0302
Asian				0.200** -0.0859
Constant				9.102*** -0.115
Observations	40,420	40,420	40,420	40,420
R-squared	0.199	0.2	0.202	0.322
Number of Individuals	8,677	8,677	8,677	

Note: Dependent variable is the log of consumption in 1990 dollars. All regressions include year dummies. Absolute values of standard errors are in parentheses. All standard errors are heteroskedastic consistent. Omitted education category is college dropouts, and omitted race category is "other". "Current Tenure in SE" is the interaction between current year in self-employment and being self-employed. "Total Tenure in SE" is the interaction between total years spent in SE and being self-employed.

Table 7: Consumption Regressions Robustness

	FE Consumption	FE Consumption	FE Food Only	OLS Consumption	OLS Consumption
Self Employed	0.0346** -0.0154	0.0435*** -0.0107	0.0155 -0.011	0.135*** -0.00759	0.152*** -0.0101
Experience	0.0333*** -0.00701	0.0285*** -0.0055	0.0216*** -0.00448	0.0287*** -0.000798	0.0304*** -0.00117
Experience Sq	-0.000566*** -5.63E-05	-0.000466*** -3.56E-05	-0.000519*** -3.32E-05	-0.000416*** -1.78E-05	-0.000430*** -2.60E-05
HS Dropout				-0.212*** -0.00738	-0.212*** -0.0108
HS Graduate				-0.0992*** -0.00527	-0.106*** -0.00725
College Grad				0.0983*** -0.00706	0.106*** -0.00944
Grad Sch				0.114*** -0.0071	0.134*** -0.00949
Married	0.239 -0.226	0.19 -0.172	0.209 -0.169	0.174* -0.102	0.144 -0.124
Spouse Wage	0.0323*** -0.00596	0.0251*** -0.00404	0.0287*** -0.00446	0.141*** -0.00371	0.149*** -0.00497
Family Size	0.0559*** -0.00495	0.0558*** -0.00303	0.0988*** -0.00332	0.0498*** -0.00177	0.0540*** -0.00255
White				-0.0151 -0.0128	-0.0268 -0.0171
Black				-0.203*** -0.0135	-0.192*** -0.0182
Hispanic				-0.0846*** -0.0296	-0.0223 -0.0624
Asian				0.186* -0.105	0.185* -0.112
Constant				9.166*** -0.104	
Observations	20,245	28,828	40,420	28,828	20,245
R-squared	0.193	0.242	0.127	0.356	0.305
Number of id	6,334	7,078	8,677		

Note: Dependent variable is the log of consumption in 1990 dollars. The first two columns use a wider set of variables to define consumption, while the third column uses only expenditures on food at home and away. All regressions include year dummies. Absolute values of standard errors are in parentheses. All standard errors are heteroskedastic consistent. Omitted education category is college dropouts, and omitted race category is "other".

Table 8: Linking Income and Consumption

	FE Consumption in SE	FE Consumption in WE	FE Consumption in SE	FE Consumption in WE
Annual Income	0.0863*** -0.00912	0.152*** -0.00457	0.0625*** -0.0083	0.102*** -0.00448
Experience			0.0685*** -0.00974	0.0240*** -0.00335
Experience Sq			-0.000908*** -8.13E-05	-0.000655*** -2.41E-05
Married			0.233*** -0.0352	0.262*** -0.00912
Observations	9,716	88,655	8,544	77,226
R-squared	0.095	0.108	0.157	0.156
Number of id	2,956	16,739	2,663	15,114

Note: Dependent variable is consumption by employment category. Annual income is measured in 1990 dollars. All regressions include year dummies. Absolute values of standard errors are in parentheses. All standard errors are heteroskastic consistent. Omitted education category is college dropouts, and omitted race category is "other".

Table 9: Variance in Consumption Regressions

	FE Residual Squared	FE Residual Squared
Self Employed	0.00559 -0.00921	-0.00449 -0.0176
SE/Tenure	0.0135 -0.0216	
SE Years 1 - 2		0.0196 -0.0203
SE Years 3 - 4		0.0154 -0.0192
SE Years 5 - 7		0.00915 -0.0163
SE Years 8 - 10		0.0141 -0.0127
SE Years 11 - 14		0.0241 -0.0195
SE Years > 14		0.024 -0.0252
Experience	0.00633 -0.00997	0.00636 -0.00995
Experience Sq	0.000111*** -3.77E-05	0.000110*** -3.81E-05
Married	-0.3 -0.246	-0.301 -0.246
Spouse Wage	-0.00201 -0.00272	-0.00202 -0.00274
Family Size	-0.00277 -0.00213	-0.00275 -0.00213
Observations	40,420	40,420
R-squared	0.013	0.013
Number of id	8,677	8,677

Note: Dependent variable is the squared residual from the consumption regression. All regressions include year dummies. Absolute values of standard errors are in parentheses. All standard errors are heteroskedastic consistent.

Table 10: Dynamics Before and After Regressions

	OLS Consumption	OLS Consumption	FE Consumption	FE Consumption	FE Consumption
BSE	0.0225*** -0.00576		-0.0148 -0.0138		
ASE		0.0761*** -0.00562		0.0182 -0.0137	-0.0229 -0.0205
Experience	0.0300*** -0.000807	0.0286*** -0.00081	0.0274*** -0.00503	0.0274*** -0.00503	0.0221*** -0.00573
Experience Sq	-0.000434*** -1.79E-05	-0.000415*** -1.80E-05	-0.000499*** -3.50E-05	-0.000499*** -3.50E-05	-0.000489*** -3.85E-05
HS Dropout	-0.237*** -0.00751	-0.234*** -0.00749			
HS Graduate	-0.124*** -0.00528	-0.122*** -0.00526			
College Grad	0.134*** -0.00707	0.133*** -0.00705			
Grad Sch	0.154*** -0.00731	0.151*** -0.00726			
Married	0.163 -0.116	0.175 -0.115	0.228 -0.204	0.228 -0.204	0.278 -0.256
Spouse Wage	0.177*** -0.00375	0.176*** -0.00374	0.0366*** -0.00403	0.0366*** -0.00402	0.0343*** -0.00431
Family Size	0.0569*** -0.00178	0.0568*** -0.00178	0.0655*** -0.00313	0.0655*** -0.00313	0.0633*** -0.00331
White	-0.0446*** -0.0107	-0.0489*** -0.0106			
Black	-0.247*** -0.0113	-0.245*** -0.0113			
Hispanic	-0.0488 -0.0301	-0.0532* -0.03			
Asian	0.199** -0.0873	0.199** -0.0865			
Constant	9.092*** -0.118	9.093*** -0.116			
Observations	40,420	40,420	40,420	40,420	32,644
R-squared	0.311	0.314	0.198	0.198	0.195
Number of id		8,677		8,677	8,162

Note: Dependent variable is the log of consumption in 1990 dollars. The two dependent variables of interest are BSE (Dummy variable for being in wage employment before ever entering self-employment) and ASE (Dummy variable for being in wage employment after exiting from the first time of entry into self-employment). The final column drops all the years in self-employment, therefore comparing the wage-employment returns before self-employment to that after for those who enter and then return. All regressions include year dummies. Absolute values of standard errors are in parentheses. All standard errors are heteroskedastic consistent. Omitted education category is college dropouts, and omitted race category is "other".



Table 11: Total Labor Income Regressions

	FE	FE	FE	OLS
	Annual Income	Annual Income	Annual Income	Annual Income
Self Employed	-0.218***	-0.289***	-0.225***	-0.352***
	(-0.0164)	(-0.025)	(-0.019)	(-0.0159)
Current Tenure in SE			0.00189	0.0229***
			(-0.00288)	(-0.0021)
Total Tenure in SE		0.0102***		
		(-0.00269)		
Experience	0.0347***	0.0344***	0.0347***	0.0554***
	(-0.00488)	(-0.00488)	(-0.00488)	(-0.000859)
Experience Sq	-0.00124***	-0.00123***	-0.00124***	-0.000995***
	(-3.59E-05)	(-3.58E-05)	(-3.61E-05)	(-1.94E-05)
HS Dropout				-0.605***
				(-0.00894)
HS Graduate				-0.224***
				(-0.00623)
College Grad				0.288***
				(-0.0082)
Grad Sch				0.370***
				(-0.00892)
Married	0.221***	0.221***	0.221***	0.592***
	(-0.0125)	(-0.0125)	(-0.0125)	(-0.00568)
White				0.173***
				(-0.0112)
Black				-0.139***
				(-0.0119)
Hispanic				-0.164***
				(-0.0436)
Asian				0.0619
				(-0.0683)
Constant				8.943***
				(-0.02)
Observations	124,134	124,134	124,134	124,134
R-squared	0.074	0.074	0.074	0.28
Number of id	19,547	19,547	19,547	

Note: Dependent variable is the log of annual labor income in 1990 dollars. All regressions include year dummies. Absolute values of standard errors are in parentheses. All standard errors are heteroskedastic consistent. Omitted education category is college dropouts, and omitted race category is "other". "Current Tenure in SE" is the interaction between current year in self-employment and being self-employed. "Total Tenure in SE" is the interaction between total years spent in SE and being self-employed.

Table 12: Hours Worked Regressions

	FE Hours	FE Hours	FE Hours	OLS Hours	OLS Hours
Self Employed	137.7*** -15.51	48.97** -21.93	143.3*** -17.18	170.9*** -12.98	85.76*** -14.88
Current Tenure in SE			-1.537 -2.4	11.97*** -1.615	
Total Tenure in SE		12.57*** -2.479			14.53*** -1.041
Experience	15.06*** -4.094	14.67*** -4.083	15.02*** -4.094	19.65*** -0.67	19.24*** -0.67
Experience Sq	-0.641*** -0.0293	-0.635*** -0.0293	-0.639*** -0.0294	-0.438*** -0.0148	-0.427*** -0.0148
HS Dropout	119.6*** -10.49	119.0*** -10.47	119.7*** -10.49	333.6*** -4.326	331.9*** -4.322
HS Graduate				-139.8*** -6.825	-137.5*** -6.819
College Grad				-35.47*** -5.108	-34.60*** -5.101
Grad Sch				59.00*** -6.912	58.39*** -6.905
Married				48.49*** -7.646	46.62*** -7.649
White				40.63*** -9.692	39.48*** -9.665
Black				-102.8*** -9.994	-102.1*** -9.968
Hispanic				-90.68*** -33.05	-85.48*** -33.05
Asian				21.95 -54.22	25.5 -54.24
Constant				1,771*** -17	1,773*** -16.97
Observations	115,021	115,021	115,021	115,021	115,021
R-squared	0.034	0.035	0.034	0.127	0.129
Number of id	18,929	18,929	18,929		

Absolute values of standard errors are in parentheses. All standard errors are heteroskedastic consistent. Omitted education category is college dropouts, and omitted race category is "other". "Current Tenure in SE" is the interaction between current year in self-employment and being self-employed. "Total Tenure in SE" is the interaction between total years spent in SE and being self-employed.

Figure 4: Probability of leaving self-employment

