# The Unobserved Returns to Entrepreneurship *

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**Abstract**

This paper resolves a longstanding empirical puzzle: that most entrepreneurs persist despite lower initial earnings and earnings growth. I hypothesize that expenditure is a better measure of self-employment returns than reported income, suffering from fewer biases. Using 38 years of longitudinal data, I find that while individuals in self-employment report earning *26.2% less*, their expenditures are *4.5% higher*. This increase comes from persistence in self-employment, with expenditure growing 0.85% more annually in self-employment as compared to that in wage employment. Increased expenditure is not offset by lower savings or higher uncertainty. In fact, wealth grows more in self-employment for those who switch into, and persist in it. Some failures in self-employment, however, do incur observable losses in lifetime expenditures and in subsequent labor income. This loss is mitigated for well educated individuals with reasonable work experience who in fact see substantial increases in future wage income after self-employment. Lastly, individuals work more in self-employment where hours worked also grow with time in self-employment. The combined findings of lower reported earnings, higher expenditure and higher wealth in self-employment points to some serious income measurement issues. The results also indicate, contrary to prevailing interpretations within the empirical literature, that the decision to persist in self-employment is fully rationalizable using just financial motivations. This is consistent with the theoretical predictions from standard occupational choice models (Jovanovic (1982), Roy (1951)).

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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[1] 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 (Hamilton, 2000). Specifically, Hamilton (2000) finds that the median individual in self-employment for ten years makes 35 percent less than her wage-employed counterpart. 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 understand how to better encourage externality generating entrepreneurial activity, we must first identify the factors that induce individuals to engage in entrepreneurship. The literature currently proposes a few explanations to rationalize this curious observation, that individuals choose self-employment despite the low returns. These explanations can be broadly categorized into heterogeneity in individual preferences over employment types, risk and time, and differences in beliefs (Blanchflower et al., 2001; Hamilton, 2000; Moskowitz and Vissing-Jørgensen, 2002; Cooper et al., 1988; Dunne et al., 1988; Camerer and Lovallo, 1999).

In this paper I use data from the Panel Study of Income Dynamics (PSID) to re-establish the puzzle, that the self-employed report earning less, in a longitudinal setting. To make sense of this anomalous finding, I propose a new hypothesis. Namely, that self-reported income is not a reliable measure of the financial returns to self-employment. Reported income is a poor measure of returns, especially for the self-employed since they have the ability to both underreport income and overstate business expenses so as to minimize income tax incidence. It is reasonable to assume that any survey of the self-employed will capture an inaccurate income statistic that is guided by motivations to underreport for tax purposes. From the survey participants' perspective, maintaining consistency across both IRS and survey reports is ideal since this involves simpler recall and avoids audit complications they may perceive as a possibility. Therefore, income reported for survey purposes is most likely very similar to that reported for tax purposes, hence highly prone to understatement. 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 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 easily captured in survey data. A few modes of compensation that may not show up in

[1] Note that in this paper, self-employment and entrepreneurship are synonymous. While this may seem curious to some, the idea underlying this classification is that unlike wage employees, self-employed individuals do not receive a wage with certainty in every period. Instead their return is riskier and a pure function of how much they put in. In this sense, the self-employed, whether they are gardeners, or founders of tech companies, are entrepreneurial.

reported income as obviously include firm shares, dividends and royalty payments. In addition, the self-employed are likely to retain earnings within their firms, especially as their firms' potential for success increases. Given this, measuring the returns to self-employment through reported earnings will at best provide the absolute lowest bound of the true financial returns.

In order to get around the problems that plague reported income, I estimate the returns to self-employment using expenditure 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 expenditure 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. While income suffers from tax misreporting incentives which then most likely bleed into self-reported survey data, this is less likely the case for reported expenditure. [2] Moreover, unlike the earnings received in wage-employment, the true earnings of a business are rarely realised instantaneously. Looking at expenditures circumvents this problem since it also captures the expected future returns that individuals most likely account for when making the decision to be involved in a given employment type.

Using fixed effects estimations over 38 years of data from the PSID, I find that while individuals report earning 26.2 percent *less* in self-employment, they in fact consume 4.5 percent *more*, implying a 30.7 percent differential between reported income and expenditures.[3] 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 expenditure in the two employment sectors in 1984. Figure 1 shows that the reported earnings distribution of the self-employed is mostly to the left of that for the wage-employed. This reaffirms the finding that most self-employed individuals report earning less than their wage-employed counterparts. Using expenditures instead, figure 2 shows that this finding is entirely flipped. The self-employed consume more than their wage-employed counterparts across the entire distribution.[4]

[2]Caveat: While there are no overt incentives to misreport expenditure, there is the possibility of systematic expenditure misreporting across the two employment types. The direction of this bias however is unclear. For example, perks in wage jobs such as meals eaten out etc are more likely to be reported as household expenditure in self-employment, causing expenditure to be overestimated in self-employment. On the flip side, expenses like car purchases could be considered a business expense in self-employment therefore not reported as household expenditure for survey purposes, leading to an underestimate of expenditure in self-employment. The expenditure measure used in this paper partially deals with this by combining various components, not just those which are likely to suffer from misreporting. Furthermore, in looking at the dynamics (Column 3, Table 7), I find that expenditure upon initial entry into self-employment does not differ from that in wage employment. If expenditure were differentially reported in wage and self-employment, this should appear the moment the transition occurs. Since I do not observe any difference in expenditure upon immediate entry into self-employment, this suggests that for survey purposes, there is no systematic difference in expenditure reporting across employment types.

[3]A point to note when making comparisons between income and expenditure estimations is that expenditure does not only capture information about current income but also captures information about future expectations. This is not the case for income, regardless of mis-measurement. As such, aside from pointing out that the two are wildly different, I shall refrain from making any further direct comparisons of the results using income to those using expenditure. Effectively, rather than making comparisons between income and expenditure, this paper points out that income is a weak measure and focuses on the returns to self-employment as measured by expenditure.

[4]The figures for 2005, 3 and 4 show the same pattern as that described here for 1984.

In further dissecting the origin of this increased expenditure, I find that expenditure upon initial entry into self-employment is not significantly different than in wage employment, but with each additional year, the self-employed experience a 0.85 percent growth in expenditure relative to that in wage-employment. Moreover, the variance of expenditure is no different in self-employment than in wage-employment. Furthermore, the self employed do not seem to be substituting expenditure for savings. In fact, fixed effects estimations show that individuals accrue more wealth while self employed and this wealth grows more with time in self-employment than in wage employment. The findings on higher expenditures, higher savings and no difference in variance can be related to the "private equity premium puzzle" as described in Moskowitz and Vissing-Jørgensen (2002). A higher mean level of expenditure that is not traded off with a higher variance implies that the risk-return tradeoff is not necessarily worse for those who are self-employed and hold most of their equity in their own private business.

In looking beyond just those years in self-employment, I find that for those who do return to wage-employment, expenditure and wage earnings are significantly lower than that prior to entry into self-employment for individuals with low levels of education and experience. However, future wage employment seems to rebound to earlier levels for individuals with approximately a high school degree and 10 years of experience in the labor market. In fact, a college educated individual with 10 years of experience makes 15 % more in subsequent wage employment than before.This suggests, that some of those who "fail" in self-employment are (a) either penalized for this failure upon returning to wage employment or (b) did not necessarily enter self-employment of their own volition[5] while other, more skilled individuals actually observe gains in human capital which are then compensated in future wage work. In a nutshell, expenditure and savings are higher for those who remain in self-employment, indicating that they are financially better off in doing so. Some who leave self-employment on the other hand, appear to have "failed" and suffer financial losses beyond their tenure in self-employment, while others appear to benefit from the human capital gained.[6]

In looking at hours worked, I find that on average, individuals work 3.2 percent more in self-employment than in wage work. Interestingly, these higher hours come with time in self-employment. In fact, upon initial entry into self-employment individuals actually work 6.4 percent less than they do in wage employment. With each additional year in self-employment hours worked grows by 1.15 percent relative to that in wage-employment. This finding implies that individuals could be responding to information they gain from survival in self-employment about the viability of their business and invest more hours as the odds of success and thereby the marginal return

[5]The implication here is that these individuals involuntarily departed their previous employers and could not find alternative wage employment, leading them to self-employment. Once their self-employment ventures are revealed as "failures", they return to wage-employment, however, the wage they can now command is lower than the last observed wage they received in wage-employment, precisely due to nature of their departure. Involuntary departure from wage-employment preceding self-employment indicates that the last wage these individuals received exceeded their worth in wage employment. This information is accounted for in the new wage they receive post self-employment.

[6]These financial losses/ gains cannot be necessarily be attributed to self-employment. Instead, as explained above, it could well be that their wage trajectory in wage-employment is altered for other reasons and that these reasons correlate with both, failure in self-employment and lower/ higher future earnings in wage-employment. Future versions of this paper will discuss occupational choice models that are consistent with these findings. See Jovanovic (1982), Lazear and Moore (1984) , Roy (1951) Lazear (2004).

to each additional hour increases.[7] The non-pecuniary joys of running ones' own enterprise may also increase with time in self-employment resulting in the choice to work more. However, given that those who persist in self-employment work more, the impact of self-employment on utility is unclear. If utility from increased expenditure exceeds disutility from increased work,[8] then the choice to be self-employed is both consumption and welfare maximizing. In addition, the joint findings of increased expenditure and more work in self-employment contributes to understanding agency problems in labor markets. In particular, when one works for others they do not capture the full benefit of their effort and so choose not to work as hard. In self-employment, the returns are fully internalized and this could induce individuals to put in more effort and work longer hours.

The combination of the four findings: that the self-employed consume more, experience a higher rate of expenditure growth, save more and do not experience greater uncertainty resolve the puzzle on why the self-employed remain so. Those who choose to persist in self-employment are financially better off both in level terms and growth rates. This, in addition to previous explanations that the self-employed also enjoy non-financial benefits, renders the decision to remain self-employed (for those who make the choice) a perfectly rationalizable one.

This paper is one of few [9] 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 three main contributions of the paper are that firstly, I propose a variety of avenues for earnings amongst the self-employed that may evade reported income in any given period. Secondly, I use expenditure[10] rather than income to estimate the financial returns to self-employment. Thirdly, I exploit the use of expenditure and savings to estimate these returns in a 38 year panel setting, enabling me to look at a variety of features of the self-employed above and beyond circumventing (some) measurement issues.

The rest of the paper is organized as follows. The next section, 2, details my main hypothesis, that reported income may not be a good measure of the returns to self-employment. Section 3 describes the data and provides some summary statistics that characterize the environment of the self-employed and section 4 discusses the use of expenditure and how it is measured. In section 5, I outline my estimation strategies and discuss the empirical findings. Section 6 summarizes and relates the findings to important issues that deserve further attention.

# 2 New Hypothesis

The new hypothesis detailed in this section documents the various avenues for financial gains in self-employment that are not fully captured by reported income. This hypothesis is broken into four subcomponents; tax evasion, different forms of income, reclassification of employment and

[7] This is in fact a distinct possibility given that over 50 percent of individuals who try self-employment leave within two years (table 3), plausibly due to the failure of their venture. People may not wish to invest such great efforts initially given the ex-ante odds of failure and as this threat is mitigated with time, investing time by working longer hours may seem less risky.

[8] Given the previous literature on non-pecuniary returns in self-employment, this does not seem infeasible.

[9] See Evans and Leighton (1989).

[10] See Pissarides and Weber (1989) and recent work by Hurst et al. (2010). Both papers also uses expenditure to argue for the prevalence of underreporting amongst the self-employed.

human capital accumulation. Tax evasion is simply the phenomenon of understating income to avoid tax payments, while the use of different forms of income is more subtle yet still unlikely to appear as self-employment earnings in survey data. Reclassification of employment occurs when exceptional entrepreneurs become classified as wage-employed or retire. Human capital accumulation refers to the possibility of gaining skills, even from failed entrepreneurial ventures, that may result in increases in productivity and earnings in post self-employment wage work. These four thus far unobserved avenues for financial returns to self-employment render reported earnings a less effectual measure of the true monetary returns to entrepreneurship. Each component of the hypothesis is described thoroughly below and section 2.5 expounds on how using expenditure captures these additional avenues for gains that elude reported income.

## 2.1 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 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 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,[11] 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 earnings 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. It stands to reason that individuals 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.

## 2.2 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

[11] Excluding farm businesses.

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 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.

## 2.3 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.

## 2.4 Human Capital Accumulation

A fourth issue to consider is that returns to self-employment may manifest beyond 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 posses 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. [12] 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. While the results in this paper do not support the notion that the average "failed" entrepreneur benefits from this human capital accumulation, it is nonetheless an important factor to consider. [13]

The PSID tracks individuals for a sufficiently long period of time such that the impact of self-employment on their post self-employment wage outcomes can be assessed. Given that about 20

[12] See Landier (2005) for a discussion on how this signal differs across countries.

[13] Take for example the failed high-tech startup. These very high skilled individuals do not necessarily suffer from having tried a risky venture. The data in the PSID are not sufficient in volume to precisely estimate this for the high tech sub-group. However, evidence from Evans and Leighton (1989) supports the notion of human capital accumulation. In a cross sectional analysis, they show using the NLSY, that self-employment experience yields higher returns in wage-employment than wage-employment experience.

percent of individuals enter self employment at some point,[14] most of whom then leave within 3 years to return to wage-employment, the impact human capital accumulation should be accounted for in evaluating the returns to self-employment.

### 2.5 Using Expenditure

The estimation strategy I propose involves using expenditure instead of reported income to capture the financial returns to self-employment. While income suffers from the various problems described above, using expenditure to a large degree circumvents these issues. There is no incentive for individuals to systematically misreport household expenditures (Meyer and Sullivan, 2003) , 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 expenditure. Given that business returns are rarely realised instantaneously, using expenditure, 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 expenditure. Particularly, one must be cautious in the way in which returns are attributed to self-employment when expenditure 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 expenditure as she cuts current expenses so as to finance the venture, and then subsequently to growth in expenditures 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 expenditure goods which could potentially lead to an increased level of expenditure in self-employment.

Information on savings and debt, could be used to address the issue on credit constraints. Identifying the retiming of expenditures is however much trickier. For now, the results should be interpreted bearing in mind these possibilities.

## 3 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 hypotheses. The PSID is a dynamic longitudinal database that tracks a nationally representative sample of individuals and families across time. In this paper, I use data from 1968 - 2005, covering a span of 38 years with data from 34 specific time periods (1968 - 1997, 1999, 2001, 2003, 2005). 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

[14] Refer to section 3 for evidence from the PSID.

employment information renders this dataset ideal for addressing the hypotheses outlined above. 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. expenditure is measured at the household level since this is the level at which it is available for most of the panel. [15] In this paper, I limit the study to both male and female household heads between the ages of 18 and 62 [16] who are not employed in agriculture or mining. [17] Individuals are classified as being "self-employed " if they report only working for themselves in any given period.[18]

## 3.1 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 16.5 years. 18.5 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 (68.32 percent) appearing as self-employed for 3 years or less. About 11 percent of these individuals who have ever been self employed [19] remain in self-employment for 10 years or more.

### 3.1.1 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 similar to those found in Hamilton 2000.[20] Specifically, the self-employed have a higher average level of potential labor market experience,[21] are more likely to be white and more likely to be married than wage-employees. A few interesting aspects to note when comparing summary statistics in 1984 to that in 2005, are that[22] the proportions of women, non-married individuals and

[15] 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.

[16] 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.

[17] These two industries face distorting government incentives. Therefore, including individuals working in these industries may bias the results.

[18] 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.

[19] I.e. of the 19 percent who ever try self-employment. This amounts to 470 individuals.

[20] Particularly, comparing the summary statistics from the PSID in 1984 yields 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 similar characteristics.

[21] This could simply imply that they are older on average since experience is constructed as the difference between age and years of schooling.

[22] Compare the 2005 summary statistics to the 1984 summary statistics in Table 1

non-white individuals have increased in the labor force overall and to a greater degree amongst the self-employed. In addition, job tenures across all employment types have decreased[23] especially amongst the self-employed.

### 3.1.2 Description of the panel

The longitudinal characteristics of the self-employed have been less thoroughly explored in the literature. 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. High school dropouts and high school graduates are less likely to attempt self-employment while college graduates and those who go to graduate school are more likely to attempt self-employment. The experience differential between the wage and self-employed observed in the cross section does not appear in the panel. This implies that, of all individuals to try self-employment, the more experienced individuals are the ones to persist. This observation loosely indicates that entrepreneurial success, at least in terms of survival, is positively correlated with experience.[24] The panel summary statistics indicate that there is marked difference in the types of individuals who even attempt self-employment as compared to wage employment.

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) spend 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 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 and work more on average than those who have only ever tried wage-employment.

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.

[23] This comes as no surprise; it is commonly known that people switch jobs more frequently now than they did in the past.

[24] 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 this observation indicates that at least on the experience margin, this standard determinant of labor market success does apply for the self-employed. However, this also shows that individuals across the spectrum of demographic characteristics are willing to make the attempt.

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

Figures 1 and 3 below provide a graphical depiction of the puzzle that motivates this paper. These figures show the distribution of annual wages for the wage and self-employed in 1984 and 2005. In both years, 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 in both 1984 and 2005. These figures re-establish the puzzle that majority of the self-employed earn less than the seemingly available alternative in wage employment.

# 4 Using expenditure from the PSID

## 4.1 Estimating the returns to self-employment using expenditure

The hypothesis on tax evasion and different forms of income described in section 2 implies that we have to look to avenues other than reported earnings and even firm profit, to be able to accurately document the financial returns to self-employment. I propose using expenditure instead of reported earnings to evaluate these returns. I justify the use of expenditure as a reflection of current income since according to the permanent income hypothesis, current consumption (as reflected by expenditures) 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 an unexpected change 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. [25] 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 expenditure in the survey.[26] [27] Therefore, the distinction between the two is based on measurement per se.

In light of hypothesis 2 what should we expect to empirically observe when using expenditure to measure the returns to self-employment? In the absence of credit constraints, [28] and only

[25] One qualification: if the loss in income during self employment was anticipated, then expenditure 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.

[26] 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.

[27] However, there still exists the possibility that expenditure 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 expenditure for the self-employed.

[28] 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

accounting for unobservable income sources, we expect to see the income difference between the wage and the self employed shrink when using expenditure 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 expenditure upon entry into self-employment and then a faster growth rate in expenditure that follows. Furthermore, in each year while self-employed, one learns that one's business hasn't failed, leading to positive news and an increase in expenditure.

## 4.2 Measure of expenditure

The PSID provides a very limited number of variables to measure expenditure. Data on expenditure is more comprehensive from 1999 onward. However, only a few variables, such as food expenditure 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 expenditure a la Skinner (1987), where expenditure is a linear combination of food expenditures (at home and away), rent, utilities, vehicle purchases and housing value. In Skinner's paper, these inputs explain over 70 percent of variation in expenditure. Skinner (1987) provides a simple technique to assign a measure of total expenditure to households using the limited available expenditure components in the PSID. He regresses the different components from the PSID on total expenditure from the Consumer Expenditure Surveys (CEX) and estimates weights that allow the variables available in the PSID to predict true total expenditure. These estimates are stable over time and explain up to 78 percent of the total variance in expenditure. 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 expenditure 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. For the main regressions in this paper I use weights[29] for the most generalized and representative version of expenditure that would enable me to have the largest number of observations. This measure of expenditure 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 expenditure, food expenses, to all other combinations proposed in Skinner (1987) that include utilities and vehicle purchases.

your venture to succeed, you may be willing to fully dis-save in anticipation of the high future returns.

[29] See Table 1 of Skinner (1987) for weights. The expenditure measures in this paper use the coefficients from Skinner's estimations to compute a representative expenditure statistic for households in the PSID. For example, the expenditure measure I use most widely in this paper comprises of food eaten at home and away, rent and imputed rent. The associated actual measure of expenditure is $C_{it} = 2.25FoodHome_{it} + 3.401FoodOut_{it} + 0.125HomeValue_{it} + 1.702Rent_{it}$ where all the weights for individual expenditure components are from Table 1, Column 3 of Skinner (1987). I repeat the exercise for various expenditure combinations and the associated weights proposed by Skinner. The simplest version of expenditure used in this paper is just the sum of food eaten and home and away, without any weights.See Aguiar and Hurst (May 2012) for a discussion on the sensitivity of food expenditure to various factors. Robustness checks are performed using these various definitions of expenditure and results are similar across all definitions.

# 5 Empirical Estimations and Results

## 5.1 Returns to Self-Employment using expenditure vs Income

Below I outline estimating equations that separately evaluate the impact of self-employment on both income and expenditure.

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

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

where,

$I_{i,t}$ is a measure of financial income which could be hourly wage or annual labor income 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. Note that in the PSID, income reported in time $t$ is that for the income earned in $t-1$ while employment status is reported for the current period. As such, reported income in $t$ corresponds to employment and demographic variables reported in $t-1$. The regression above is performed both on the entire dataset, interpreting results as cross sectional, and accounting for individual fixed effects.

Regression to estimate the impact of being self-employed on observed expenditure:

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

where the the dependent variable, $C_{it}$, is expenditure. In the PSID, expenditure reported in time $t$ corresponds to actual expenditure in time $t$. Therefore, unlike the regression in equation 1, expenditure need not be regressed against lagged variables. 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 $\beta_1$ 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 expenditure 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 expenditure. 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. However, the purpose of this paper if to evaluate the returns to self-employment and for this purpose, the prosed estimation strategies suffice.

The intuition of the results is nicely conveyed by comparing the earnings distribution to the expenditure distribution for the wage and self-employed as displayed in figures 1 vs 2 (1984) and figures 3 vs 4 (2005). In both years 1984 and 2005, the earnings distribution for the self-employed is to the left of that for the wage employed (albeit more positively skewed), while the expenditure distribution for the self-employed is to the right of that for the wage employed. Both the income

and expenditure distributions differ significantly across the wage and self-employed. In performing a Kolmogorov Smirnov test for the difference in distributions, I find that these distributions are not just optically different but are also statistically different. [30]

Tables 5 and 6 report results for the specification in equation 1. The dependent variables in tables 5 and 6 are hourly wage and annual income respectively. Table 7 reports results for the regressions wherein texpenditure is the dependent variable. In a fixed effect setting I confirm the finding in the literature that the self-employed earn less than the wage employed. Specifically, controlling for unobserved individual characteristics and using reported annual income to measure financial returns, I find that individuals earn *26.2 percent less* in self-employment than they do in wage employment (column 1 in table 6). When I use expenditure instead of annual income, I find that the self-employed consume *4.5 percent more* in self-employment than they did in wage-employment (column 1 in table 7).[31] These results are highly significant, both economically and statistically (at the 1 percent level). Robustness checks in table 14 show that the results are similar across different definitions of expenditure, including the most basic measure, food expenditures. Using expenditure to measure the returns to self-employment resolves the longstanding enigma surrounding the decision that the self-employed make to remain so. [32]

The results also provide more insight into self-employment returns than simply pointing out that they are higher. Referring to column 3 in table 7 I find that expenditure in self-employment per se is not statistically different, but with each additional year of being self-employed, individuals experience a growth in expenditure of 0.85 percent more as compared to that in wage employment. This implies that in the 10th year of self-employment, one consumes 8.5 percent more than they would have were they wage-employed.[33] The finding that expenditure 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

[30] Significance is measured at the 1 percent level. The analogous distributions for hourly wage can be found in the Appendix; figures 5 and 6.

[31] The results presented in table 5 for regressions using hourly wage instead of annual wage provide an even more pronounced result that individuals earn 29.6 percent less in self than wage employment. An interesting point to note is that this implies the self-employed work longer hours. This observation is formalized and discussed in section 5.6.

[32] 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 19 show that higher reported income for the self-employed correlates positively with higher expenditure. This implies that the ordinality of reported income generally corresponds with entrepreneurial success since this is reflected in expenditure. However, these regressions also show that expenditure is less responsive to reported income for the self-employed than the wage employed. These coefficients should interpreted bearing in mind the following. For one, elasticity is defined at a point and given income underreporting, it is unclear how much less elastic expenditure is to income for the self-employed. In addition, the correlation between expenditure 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. In sum the point of these estimations is to simply show that income reporting amongst the self-employed is not entirely ad hoc and that those who consume more do in fact report earning more.

[33] This statement only holds under the assumption that the expenditure trajectory in wage-employment would have continued as such in the absence of attempting self-employment.

expenditure early on. These findings indicate 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 7) it is clear that wealth is a determinant of entry into self-employment.[34] From the OLS results, the self-employed consume 5.9 percent more controlling for tenure, and with each additional year consume 1.6 percent more. Column 2 of table 7 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" [35] are both positive and significant in the expenditure regressions. Including either of these terms results in the insignificance of the self-employment dummy. This implies that the gains from self-employment generally accrue over time in self-employment and that the returns to remaining self-employed increase with time.[36]

Given that the expenditure bundle used comprises fairly rudimentary goods (albeit weighted to be representative of total expenditure), it can be argued that these estimates if anything provide a lower bound for the true expenditure difference since we are not including any luxury goods.[37]

## 5.2 Variance in expenditure

While showing that mean expenditure 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 expenditure is higher, then it is not clear that individuals are better off being self-employed. This section of the paper looks at how the variance of expenditure 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 expenditure regression on self-employment, time in self-employment and other controls. Specifically, I use the residuals obtained from the fixed effects regression specified in equation 2 (corresponding to column 3 of table 7) to estimate the conditional heteroskadasticity with the following specification:

$$u_{it}{}^2 = A_i + B_t + \theta_1 SE_{it} + \theta_2 SE_{it}/Tenure_{it} + \theta_3 X_{it} + \eta_{it} \tag{3}$$

[34] The OLS coefficient for self-employment is 5.9 percent while the fixed effect coefficient is 0.8 percent. This implies a positive covariance between self-employment and unobservables that fixed effects account for, such as wealth.

[35] "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.

[36] 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.

[37] 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 expenditure goods higher than less tangible goods like pension plans and insurance that generally come with wage-employment. If this were the case, I would be over-estimating the impact that self-employment has on expenditure. 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.

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 8 show that being in self-employment does not significantly impact the variance of expenditure. The coefficients of interest are not economically or statistically 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 expenditure smoothing by reallocating their savings to avoid any unpleasant changes in expenditure. However, despite the statistical insignificance, the results in column 2 of table 8 reveals a positive coefficient in the earlier years of self-employment and the resolution of this risk with time. These interpretations of the results are to be taken with a grain of salt due to the lack of significance. Regardless, the results show that the self-employed do not suffer from a greater degree of unpredictability in expenditure. 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.

A further implication of this result relates to the findings of Moskowitz and Vissing-Jørgensen (2002). In their paper, the authors document that entrepreneurial investment is highly concentrated despite a seemingly worse risk-return tradeoff. The results in this paper, that mean expenditure is higher at no expense in terms of uncertainty indicate that perhaps the risk return tradeoff is not quite so abysmal. Business owners have private information on their true business earnings and the riskiness of their ventures. This knowledge will manifest in their expenditure decisions. Rather than looking at the cross sectional distribution of returns to private and public equity as in Moskowitz and Vissing-Jørgensen (2002), this paper uses longitudinal data and expenditure as an alternative measure to capture the returns to self-employment (which includes the returns from private equity). The results using this alternative measure suggest re-thinking the private equity premium puzzle described in Moskowitz and Vissing-Jørgensen (2002), where the average private equity returns are not significantly higher than the market return, but the variance is.

## 5.3 Savings

Despite higher expenditures without any increase in uncertainty, we still cannot definitively claim that the self-employed are in fact financially better off. The self-employed may have different preferences that lead them to draw on their savings so as to finance an increase in expenditure. In this section I test to see if the self-employed are simply substituting savings for expenditure. The PSID provides information on total wealth and its components in the years 1984, 1989, 1994, 1999, and then biennially thereafter. These data can be found in the PSID "Supplemental Wealth Files". Total wealth is comprised of the sum of one's equity in real estate, business, vehicle, stock, transaction accounts, other assets and IRA, less debt. The fixed effects estimations described below are identified off seven time periods, including 1984, 1989, 1994, 1999, 2001, 2003 and 2005.

Tables 9 and 10 describe how wealth changes with self-employment and with time in self-employment. [38] From the fixed effects estimations with no data transformations, the results indi-

[38] The results discussed here refer to wealth including the value of home equity. The results excluding home equity

cate that individuals who move into self-employment experience on average, a $137, 576 increase in wealth as compared to that in wage employment. Once again, like with expenditures, all the action comes from those who persist in self-employment. In the estimations including the interaction of wealth and tenure in self-employment, wealth does not see a significant increase in value upon entry into self-employment but increases by $24469 with each additional year of persistence. Table 10 looks at how wealth changes when business value is excluded from the total wealth measure. The results show that wealth excluding business value increases by $37084 on average. Here as well, the action comes from persistence with non-business wealth remaining unchanged upon initial entry into self-employment and then increasing by $11540 with each additional year in self-employment. These findings indicate that self-employed individuals certainly reinvest wealth into their firms, especially as they gain new information about how likely it is to succeed as it survives. However, they do not remain fully undiversified, and also appear to invest in non-business related assets. That said, a larger portion of the increase in wealth comes from the increase in their business value than from other sources. This result is consistent with Moskowitz and Vissing-Jørgensen (2002)'s finding of high concentration in entrepreneurial investment.

Columns 3 and 4 in table 10 look at how debt changes with self-employment. Interestingly, the results show no significant increase in debt with self-employment. While the coefficients are not statistically significant, the signs indicate an increase in debt upon entry into self-employment that reduces with time. The lack of a significant relationship between debt and self-employment can arise if individuals who are self-employed do not necessarily incur high initial entry costs, especially if they do not engage in capital intensive ventures. Alternatively, it could be that they access equity, rather than debt when starting their new ventures. [39] These debt results also suggest that underreporting is a huge source of the increase in expenditure. The findings of lower earnings, higher expenditure, higher wealth and no increase in debt suggests that underreporting is what is driving the wedge between reported earnings and consumption.

Robustness tests using various transformations of the wealth and debt data show that the results discussed above hold.[40]

The results from these wealth estimations indicate that the self-employed do not display a preference for expenditure at the expense of saving. True earnings are the sum of expenditure, savings and taxes paid. Given the finding of higher expenditure and higher savings, evidence for higher overall income amongst the self-employed, especially those who persist, is compelling.

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are very similar.

[39]Note that The PSID questionnaire actually includes debt from both institutional sources and personal sources, such as family and friends. This is important since most new business financing comes from friends and family.

[40]Since wealth is right skewed but includes negative values, I first looked at the estimations absent any data transformations. I also performed two additional robustness tests. First, I use a cube root transformation on wealth and the signs of the coefficients remain the same as those where the data are not transformed. However, the magnitudes are less generally interpreted due to the transformation. Second, I do a transformation which involves first adding the absolute value of the smallest negative value plus one to all observations and then take logs. The sign of the results remain the same as those where they data are not transformed , but once again, interpretation of magnitudes is less obvious. See appendix.

## 5.4 The Self-Employed Before Entry

The expenditures analysis done thus far presumes that entry into self-employment is unanticipated. Therefore any increase in expenditures comes from either new revenue or from expectations of future success. However, if individuals anticipate entry into self-employment, then they may start saving by cutting back on expenditures prior to entry into self-employment. This behavior would elicit an increase in consumption and the observed growth in consumption, even absent any income change. To test for this, I look at how expenditure in one and two years prior to entry into self-employment compares to all other periods before self-employment for a given individual. Table 11 shows that there is no statistically significant evidence for precautionary cut in expenditure, both one year and two years prior to entry into self-employment. The sign on precautionary expenditure behavior is however negative but the standard errors are so large that it would not be useful to attach economic meaning to this.

## 5.5 The Self-Employed After Entry

Table 3 shows that about 70% of individuals who try self-employment leave within three years. What happens to these individuals once they leave? This section explores whether these so called "failed" entrepreneurs do better or worse after self employment than they did before. It is important to note that none of this discussion will causally identify the impact of self-employment on subsequent labor market outcomes. Ultimately, individuals enter self-employment for different reasons, some out of their own volition and others for lack of choice. This selection into self-employment makes it very difficult to identify the impact of self-employment on wage outcomes. The results presented here nonetheless provide some insight into what these outcomes look like.

The estimations in table 12 look at the economic outcomes of those who ever try self-employment after initial entry. Column 1 includes all individuals who ever try self-employment and all time periods after initial entry into self employment. This includes stayers and leavers. Columns 2 and 3 include only those who leave self-employment after having entered. Column 2 shows that those who leave, regardless of whether they go back to wage work, are unemployed or leave the labor force, spend 5% less after having left self-employment than they did prior to ever having entered. Column 4 shows that those who leave self-employment and return to wage work spend 3.8% less after having left self-employment than they did prior to ever having entered.

This last result is better understood by looking at the wage earnings for these individuals. Column 4 shows that Individuals who leave self-employment and return to wage work make on average 25% less than they did in wage work prior to entering self employment. Column 5 however shows that these losses are greatest for individuals with low education and experience. Future wage employment seems to rebound to earlier levels for individuals with approximately a high school degree and 10 years of experience in the labor market. In fact, a college educated individual with 10 years of experience does not suffer any losses from having tried self-employment, and makes 15 % more in subsequent wage employment than before.

These findings indicate that the returns to skills gained in self-employment differ by initial human capital as measured by education and experience. There could well be "necessity" and "opportunity" entrepreneurs, the former who do not enter of their own volition and the latter who

make the choice. The results suggest that for those making the choice, who presumably have reasonable outside wage options due to their skill level, attempting self-employment may well lead to human capital accumulation that is compensated in future wage work. (a la Lazear 2004)

## 5.6 Hours Worked

In order to have a better sense for how self employment impacts utility, it is important to not only evaluate how individuals fare financially but also how much they work for these financial rewards. 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.[41] 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 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. The results presented so far provide empirical support for this third possibility. expenditure and savings amongst the self-employed is higher, indicating higher financial returns, and results from the hourly wage versus annual income regressions in tables 5 and 6 indicate that hours worked by the self-employed are also higher.

From table 13, the fixed effects regression in column 1 shows that individuals work on average 3.2 percent more per year in self-employment than wage-employment. Column 2 of table 13 shows that this increase in hours worked comes from time spent in self-employment. When controlling for tenure in self-employment, the estimations in column 2 show that individuals work 6.4 percent less upon initial entry into self-employment and work 1.15 percent more with each additional year in self-employment. This finding is consistent with the idea that the marginal return to each hour worked increases as an individual learns about the viability of their venture. Alternatively this finding could simply reflect that those who spend very short amounts of time in self-employment may simply be between jobs or taking time off by working privately and therefore put in less time when they initially appear as self-employed in the data. A third interpretation of this finding is that the more hardworking entrepreneurs are the ones to survive and succeed. Another interesting insight comes from comparing the the OLS estimate in column 4 to the fixed effects estimate in column one. The coefficient for being self-employed is 9.78 percent in the OLS estimation and 3.2 percent in the fixed effects estimation. This implies a positive covariance between the choice to become self-employed and working harder (or at least more hours) in general.

Individuals on average consume 4.5 percent more but work 3.2 percent more in self employment. Provided the marginal disutility from working the extra hours is not too high, which the previous literature on non-pecuniary returns suggests, and the marginal utility from consuming more is high enough, it could convincingly be argued that the self-employed are better off both financially and in terms of overall utility. In addition, the combination of growth in expenditure and

[41] Unless of course the non-pecuniary returns are so high that this is compensated for.

growth in hours worked is consistent with the idea that the self-employed put in more effort as they learn about the viability of their business to become more certain of the return to each additional hour input. The results in this section also suggest that in order to succeed as an entrepreneur, one has to be more hardworking. Additionally, the choice of working longer hours could imply higher marginal returns to hours worked in self-employment, indicating that the nature of the work and returns to hours worked across the two employment types are different. Finally, the combination of higher expenditure and higher hours worked in self-employment has implications for agency problems in labor markets. The self-employed may be willing to work more since they get to fully internalize the returns to their effort.

# 6 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 reported income (both business and labor) 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 experience higher expenditure on average and higher growth in expenditure when they are self-employed than when they are wage-employed. This explains at least in part the motivation to persist in self-employment. When evaluating the net gains in self-employment for everyone that makes the attempt, including those who "fail", I find that those who persist are financially better off, while outcomes for those who "fail" very depending on initial skill level. I also find that the variance in expenditure does not change and that the self-employed save more, with wealth increasing in self-employment tenure. Those who persist in self-employment also work longer hours which grow with time in self-employment. Given previous work on non-pecuniary returns, one could argue that for those who make the choice, self-employment has a positive impact on overall welfare as measured by utility.

These results also give rise a host of interesting questions. If the vast difference between reported income and expenditure amongst the self-employed is in large part driven by income underreporting, this should lead to further thought on the welfare effects of entrepreneurship. Is expenditure for the self-employed being subsidized, and are the positive externalities generated by them sufficient to justify this? What is the lifetime cost to being a failed entrepreneur? What is the relationship between the skills needed to succeed in self-employment and those needed for wage-employment? Is the level of entry into self-employment too high given the high failure rates and the seemingly low cost of failure to some of those "failures"? Alternatively, given the high degree of uncertainty new businesses face, is this the correct amount of entry? The joint findings of increased expenditure and work in self-employment possibly imply that individuals are incentivized to work harder when they get to fully internalize the gains from doing so. This raises questions on agency problems in labor markets. While I do not go into welfare analyses, the results presented urge more careful thinking about such issues.

The findings in this paper suggest seriously rethinking how the returns to self-employment are measured. The expenditure and savings results suggest questioning the prevailing interpretations

within the literature on whether individuals optimally select into self- employment given the risk-return tradeoff.

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# 7 Tables

Table 1: Cross Sectional Summary Statistics

| | [1] 1984 Paid Employees | [2] 1984 Self Employed | [3] 2005 Paid Employees | [4] 2005 Self Employed |
|---|---|---|---|---|
| Experience | 17.08 | 20.82 | 19.97 | 23.82 |
| (total years in labor force) | [11.42] | [10.80] | [11.28] | [10.68] |
| Tenure | 10.78 | 13.43 | 5.47 | 6.42 |
| (average years in each job) | [7.73] | [12.97] | [5.48] | [6.29] |
| HS Drop | 0.15 | 0.15 | 0.10 | 0.11 |
| (proportion of sample) | [0.36] | [0.36] | [0.30] | [0.31] |
| HS Grad | 0.35 | 0.24 | 0.35 | 0.33 |
| (proportion of sample) | [0.47] | [0.43] | [0.47] | [0.47] |
| College Drop | 0.27 | 0.28 | 0.27 | 0.24 |
| (proportion of sample) | [0.45] | [0.45] | [0.44] | [0.43] |
| College Grad | 0.12 | 0.17 | 0.15 | 0.14 |
| (proportion of sample) | [0.32] | [0.37] | [0.36] | [0.35] |
| Grad School | 0.11 | 0.17 | 0.08 | 0.12 |
| (proportion of sample) | [0.31] | [0.38] | [0.27] | [0.33] |
| White | 0.62 | 0.83 | 0.55 | 0.63 |
| (proportion of sample) | [0.48] | [0.37] | [0.49] | [0.48] |
| Married | 0.64 | 0.79 | 0.56 | 0.68 |
| (proportion of sample) | [0.48] | [0.41] | [0.49] | [0.47] |
| Male | 0.78 | 0.91 | 0.72 | 0.84 |
| (proportion of sample) | [0.42] | [0.29] | [0.45] | [0.37] |
| Annual Hours Worked | 1891 | 2190 | 2079 | 2097 |
| (average hours worked annually) | [575.23] | [865.28] | [721.94] | [963.09] |
| Observations | 4063 | 425 | 5571 | 707 |

Summary of means in the cross sections, 1984 and 2005. Standard errors in parentheses. Note that the number of observations for tenure in colum 1 is 2846, column 2 is 340, column 3 is 5115 and column 4 is 665. Experience and Annual hours worked are estimated off approximately (within 30 observations) the number of observations denoted in the "observations" row. All other variables are estimated from exactly the number of obsevations denoted in the "observations" row.

Table 2: Panel Summary Statistics

| | | Ever attempted self-employment | | Only attempted wage employment | |
|---|---|---|---|---|---|
| | | Mean | Std. Dev. | Mean | Std. Dev. |
| Experience | overall | 19.96 | 11.50 | 19.17 | 12.17 |
| (total years in labor force) | between | | 11.07 | | 11.98 |
| | within | | 6.76 | | 5.81 |
| Tenure | overall | 9.30 | 6.95 | 9.06 | 6.91 |
| (average years in each job) | between | | 5.15 | | 4.79 |
| | within | | 2.91 | | 2.41 |
| HS Drop | overall | 0.18 | 0.39 | 0.22 | 0.41 |
| (proportion of sample) | between | | 0.41 | | 0.41 |
| | within | | 0.02 | | 0.02 |
| HS Grad | overall | 0.29 | 0.45 | 0.35 | 0.48 |
| (proportion of sample) | between | | 0.46 | | 0.48 |
| | within | | 0.04 | | 0.04 |
| College Drop | overall | 0.26 | 0.44 | 0.25 | 0.43 |
| (proportion of sample) | between | | 0.43 | | 0.43 |
| | within | | 0.03 | | 0.02 |
| College Grad | overall | 0.14 | 0.34 | 0.10 | 0.29 |
| (proportion of sample) | between | | 0.32 | | 0.29 |
| | within | | 0.02 | | 0.02 |
| Grad School | overall | 0.12 | 0.33 | 0.08 | 0.26 |
| (proportion of sample) | between | | 0.29 | | 0.23 |
| | within | | 0.00 | | 0.01 |
| White | overall | 0.72 | 0.45 | 0.55 | 0.50 |
| (proportion of sample) | between | | 0.47 | | 0.50 |
| | within | | 0.00 | | 0.00 |
| Married | overall | 0.69 | 0.46 | 0.58 | 0.49 |
| (proportion of sample) | between | | 0.42 | | 0.45 |
| | within | | 0.25 | | 0.22 |
| Male | overall | 0.85 | 0.36 | 0.72 | 0.45 |
| (proportion of sample) | between | | 0.39 | | 0.47 |
| | within | | 0.00 | | 0.00 |
| Annual Hours Worked | overall | 2109 | 838 | 1952 | 646 |
| (average hours worked annually) | between | | 681 | | 549 |
| | within | | 626 | | 476 |

Summary of means. "Ever attempted self-employment" refers to individuals who have at some point appeared as self-employed in the PSID. "Only attempted wage employment" refers to individuals who have appeared as wage employed at some point in the PSID, but never as self-employed. 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

| [1] Years In Self Employment | [2] Number of individuals | [3] Percentage |
|---|---|---|
| 1 | 1794 | 42.1 |
| 2 | 683 | 16.03 |
| 3 | 434 | 10.19 |
| 4 | 291 | 6.83 |
| 5 | 173 | 4.06 |
| 6 | 150 | 3.52 |
| 7 | 98 | 2.3 |
| 8 | 94 | 2.21 |
| 9 | 74 | 1.74 |
| 10 | 47 | 1.1 |
| 11 | 62 | 1.46 |
| 12 | 50 | 1.17 |
| 13 | 43 | 1.01 |
| 14 | 39 | 0.92 |
| 15 | 47 | 1.1 |
| 16 | 29 | 0.68 |
| 17 | 23 | 0.54 |
| 18 | 16 | 0.38 |
| 19 | 20 | 0.47 |
| 20 | 17 | 0.4 |
| 21 | 16 | 0.38 |
| 22 | 10 | 0.23 |
| 23 | 13 | 0.31 |
| 24 | 8 | 0.19 |
| 25 | 6 | 0.14 |
| 26 | 7 | 0.16 |
| 27 | 6 | 0.14 |
| 28 | 5 | 0.12 |
| 29 | 2 | 0.05 |
| 30 | 2 | 0.05 |
| 31 | 1 | 0.02 |
| 33 | 1 | 0.02 |
| Total | 4261 | 100 |

Note: Column 2 counts the number of individuals who have ever been self-employed for the corresponding number of years in column 1. Column 3 divides column 2 by the total number of individuals who have ever tried self-employment.

Table 4: Transition Probabilities

| | Other | Wage | Wage & Self | Self |
|---|---|---|---|---|
| Other | 70.72 | 25.61 | 0.33 | 3.30 |
| Wage | 6.44 | 90.49 | 0.72 | 2.28 |
| Wage & Self | 4.55 | 45.55 | 23.13 | 26.63 |
| Self | 6.55 | 16.41 | 3.22 | 73.78 |

Probability of going from row category of employment in period t to column category in period t+1. The "other" category refers to individuals who are either outside the labor force or unemployed.

Table 5: Hourly Wage

| | [1] FE Hourly Wage | [2] FE Hourly Wage | [3] FE Hourly Wage | [4] OLS Hourly Wage |
|---|---|---|---|---|
| Self Employed | -0.296*** | -0.302*** | -0.320*** | -0.439*** |
| | [0.0201] | [0.0312] | [0.0232] | [0.0183] |
| Current Tenure in SE | | | 0.00584* | 0.0173*** |
| | | | [0.00334] | [0.00257] |
| Total Tenure in SE | | 0.000709 | | |
| | | [0.00311] | | |
| Experience | 0.0262*** | 0.0262*** | 0.0263*** | 0.0401*** |
| | [0.00383] | [0.00384] | [0.00384] | [0.000861] |
| Experience Sq | -0.000712*** | -0.000711*** | -0.000718*** | -0.000708*** |
| | [4.02e-05] | [4.01e-05] | [4.07e-05] | [2.01e-05] |
| Married | 0.0313*** | 0.0313*** | 0.0313*** | 0.0677*** |
| | [0.0118] | [0.0118] | [0.0118] | [0.0123] |
| Log spouse Wage | 0.0113** | 0.0114** | 0.0114** | 0.0463*** |
| | [0.00524] | [0.00524] | [0.00524] | [0.00314] |
| Family Size | 0.00776** | 0.00775** | 0.00774** | 0.000174 |
| | [0.00350] | [0.00350] | [0.00350] | [0.00185] |
| HS Dropout | | | | -0.380*** |
| | | | | [0.00786] |
| HS Graduate | | | | -0.153*** |
| | | | | [0.00572] |
| College Grad | | | | 0.246*** |
| | | | | [0.00791] |
| Grad Sch | | | | 0.338*** |
| | | | | [0.00842] |
| White | | | | 0.114*** |
| | | | | [0.0117] |
| Black | | | | -0.0618*** |
| | | | | [0.0121] |
| Constant | | | | 1.583*** |
| | | | | [0.0358] |
| Observations | 69,077 | 69,077 | 69,077 | 69,077 |
| R-squared | 0.067 | 0.067 | 0.067 | 0.203 |
| No. Individuals | 9,715 | 9,715 | 9,715 | |

Note: Dependent variable is the log of hourly wage in 1990 dollars. Fixed effects (FE) are at the individual level. All regressions include year dummies. Standard errors are in parentheses. All standard errors are heteroskadastic 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: Total Labor Income

| | [1] FE Annual Income | [2] FE Annual Income | [3] FE Annual Income | [4] OLS Annual Income |
|---|---|---|---|---|
| Self Employed | -0.262*** | -0.367*** | -0.291*** | -0.374*** |
| | [0.0216] | [0.0334] | [0.0248] | [0.0195] |
| Current Tenure in SE | | | 0.00685** | 0.0235*** |
| | | | [0.00349] | [0.00267] |
| Total Tenure in SE | | 0.0125*** | | |
| | | [0.00329] | | |
| Experience | 0.0393*** | 0.0389*** | 0.0395*** | 0.0486*** |
| | [0.00442] | [0.00442] | [0.00443] | [0.00108] |
| Experience Sq | -0.00115*** | -0.00114*** | -0.00116*** | -0.000957*** |
| | [5.18e-05] | [5.15e-05] | [5.24e-05] | [2.57e-05] |
| Married | 0.0458*** | 0.0458*** | 0.0457*** | 0.0991*** |
| | [0.0142] | [0.0142] | [0.0142] | [0.0153] |
| Log spouse Wage | 0.00384 | 0.00389 | 0.00391 | 0.0487*** |
| | [0.00570] | [0.00569] | [0.00570] | [0.00349] |
| Family Size | 0.00847** | 0.00836** | 0.00845** | 0.00460** |
| | [0.00423] | [0.00423] | [0.00423] | [0.00229] |
| HS Dropout | | | | -0.431*** |
| | | | | [0.00978] |
| HS Graduate | | | | -0.166*** |
| | | | | [0.00671] |
| College Grad | | | | 0.266*** |
| | | | | [0.00892] |
| Grad Sch | | | | 0.334*** |
| | | | | [0.00988] |
| White | | | | 0.133*** |
| | | | | [0.0133] |
| Black | | | | -0.106*** |
| | | | | [0.0139] |
| Constant | | | | 9.164*** |
| | | | | [0.0413] |
| Observations | 69,115 | 69,115 | 69,115 | 69,115 |
| R-squared | 0.07 | 0.071 | 0.071 | 0.183 |
| No. Individuals | 9,717 | 9,717 | 9,717 | |

Note: Dependent variable is the log of annual labor income in 1990 dollars. Fixed effects (FE) are at the individual level. All regressions include year dummies. Standard errors are in parentheses. All standard errors are heteroskadastic 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: Expenditure

| | [1] FE Consumption | [2] FE Consumption | [3] FE Consumption | [4] OLS Consumption | [5] OLS Consumption |
|---|---|---|---|---|---|
| Self Employed | 0.0449*** | -0.00924 | 0.00849 | 0.150*** | 0.0588*** |
| | [0.00805] | [0.0117] | [0.00930] | [0.00571] | [0.00126] |
| Current Tenure in SE | | | 0.00845*** | | 0.0158*** |
| | | | [0.00161] | | [0.00106] |
| Total Tenure in SE | | 0.00699*** | | | |
| | | [0.00136] | | | |
| Experience | 0.0220*** | 0.0218*** | 0.0221*** | 0.0320*** | 0.0317*** |
| | [0.00260] | [0.00260] | [0.00260] | [0.000607] | [0.000605] |
| Experience Sq | -0.000531*** | -0.000526*** | -0.000537*** | -0.000510*** | -0.000512*** |
| | [2.31e-05] | [2.30e-05] | [2.33e-05] | [1.35e-05] | [1.34e-05] |
| Married | 0.216*** | 0.216*** | 0.215*** | 0.423*** | 0.422*** |
| | [0.0552] | [0.0553] | [0.0552] | [0.0194] | [0.0194] |
| Log spouse Wage | 0.0162*** | 0.0162*** | 0.0163*** | 0.0582*** | 0.0588*** |
| | [0.00141] | [0.00141] | [0.00141] | [0.00126] | [0.00126] |
| Family Size | 0.0614*** | 0.0614*** | 0.0614*** | 0.0521*** | 0.0524*** |
| | [0.00245] | [0.00244] | [0.00244] | [0.00134] | [0.00134] |
| HS Dropout | | | | -0.287*** | -0.282*** |
| | | | | [0.00556] | [0.00557] |
| HS Graduate | | | | -0.136*** | -0.135*** |
| | | | | [0.00394] | [0.00393] |
| College Grad | | | | 0.189*** | 0.187*** |
| | | | | [0.00518] | [0.00516] |
| Grad Sch | | | | 0.225*** | 0.222*** |
| | | | | [0.00559] | [0.00558] |
| White | | | | 0.0147** | 0.0122* |
| | | | | [0.00707] | [0.00707] |
| Black | | | | -0.209*** | -0.210*** |
| | | | | [0.00753] | [0.00752] |
| Constant | | | | 8.535*** | 8.534*** |
| | | | | [0.0283] | [0.0283] |
| Observations | 73,916 | 73,916 | 73,916 | 73,916 | 73,916 |
| R-squared | 0.195 | 0.196 | 0.196 | 0.297 | 0.3 |
| No. Individuals | 11,700 | 11,700 | 11,700 | | |

Note: Dependent variable is the log of consumption in 1990 dollars. Fixed effects (FE) are at the individual level. All regressions include year dummies. Standard errors are in parentheses. All standard errors are heteroskadastic 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 8: Variance in expenditure

| | [1] FE Residual Squared | [2] FE Residual Squared |
|---|---|---|
| Self Employed | 9.89E-05 | 0.0104 |
| | [0.00511] | [0.0141] |
| SE/Tenure | 0.0115 | |
| | [0.00736] | |
| SE Years 1 - 2 | | -0.00229 |
| | | [0.0142] |
| SE Years 3 - 4 | | -0.00199 |
| | | [0.0140] |
| SE Years 5 - 7 | | -0.00756 |
| | | [0.0136] |
| SE Years 8 - 10 | | -0.00913 |
| | | [0.0141] |
| SE Years 11 - 14 | | -0.0176 |
| | | [0.0136] |
| SE Years > 14 | | -0.0107 |
| | | [0.0147] |
| Experience | -0.00393*** | -0.00393*** |
| | [0.00145] | [0.00145] |
| Experience Sq | 8.44e-05*** | 8.47e-05*** |
| | [1.10e-05] | [1.11e-05] |
| Married | -0.139* | -0.139* |
| | [0.0714] | [0.0714] |
| Log spouse Wage | -0.00231*** | -0.00232*** |
| | [0.000791] | [0.000791] |
| Family Size | -0.0015 | -0.00151 |
| | [0.00121] | [0.00121] |
| Observations | 73,916 | 73,916 |
| R-squared | 0.007 | 0.007 |
| No. Individuals | 11,700 | 11,700 |

Note: Dependent variable is the squared residual from the main fixed effects consumption regression. Fixed effects (FE) are at the individual level. All regressions include year dummies. Standard errors are in parentheses. All standard errors are heteroskadastic consistent.

Table 9: Wealth I

| | [1] FE Wealth | [2] FE Wealth | [3] OLS Wealth |
|---|---|---|---|
| Self Employed | 137,576** | 33,982 | 249,872*** |
| | [58,048] | [59,083] | [22,927] |
| Current Tenure in SE | | 24,469*** | |
| | | [5,577] | |
| Age | 6,565 | 6,440 | 6,516*** |
| | [8,384] | [8,381] | [358.5] |
| Log Spouse Wage | -11,503 | -10,861 | 15,064*** |
| | [9,044] | [9,079] | [3,394] |
| Married | 66,595** | 58,340** | 73,181*** |
| | [26,304] | [29,150] | [17,058] |
| Family Size | -1,885 | -1,193 | -2,222 |
| | [7,450] | [7,398] | [2,725] |
| HS Dropout | | | -75,539*** |
| | | | [9,442] |
| HS Grad | | | -39,214*** |
| | | | [7,574] |
| College Grad | | | 57,038*** |
| | | | [13,736] |
| Grad Sch | | | 84,636*** |
| | | | [16,499] |
| White | | | 48,877*** |
| | | | [6,962] |
| Black | | | -10,334 |
| | | | [6,755] |
| Constant | | | -384,726*** |
| | | | [37,190] |
| Observations | 19,850 | 19,850 | 19,850 |
| R-squared | 0.028 | 0.034 | 0.078 |
| No. Individuals | 7,402 | 7,402 | |

Table 10: Wealth II

| | [1] FE Wealth (less business) | [2] FE Wealth (less business) | [3] FE Debt | [4] FE Debt |
|---|---|---|---|---|
| Self Employed | 37,084* | -11,772 | 575.8 | 1,457 |
| | [19,062] | [20,224] | [879.4] | [1,132] |
| Current Tenure in SE | | 11,540*** | | -208.2 |
| | | [3,149] | | [171.2] |
| Age | 9,118 | 9,059 | -335 | -333.9 |
| | [6,124] | [6,107] | [253.8] | [254.0] |
| Log Spouse Wage | -8,974 | -8,671 | 406.8* | 401.3* |
| | [6,407] | [6,433] | [220.6] | [220.9] |
| Married | 45,687* | 41,794 | 134.8 | 205 |
| | [25,617] | [27,371] | [1,403] | [1,404] |
| Family Size | 4,417 | 4,743 | -373.8 | -379.7* |
| | [3,457] | [3,425] | [227.3] | [228.1] |
| Observations | 19,850 | 19,850 | 19,850 | 19,850 |
| R-squared | 0.038 | 0.042 | 0.003 | 0.003 |
| No. Individuals | 7,402 | 7,402 | 7,402 | 7,402 |

Note: Dependent variable in columns 1 and 2 is wealth (less business value) in 1990 dollars. The wealth measure is the sum of the value of checking and savings, stocks and bonds, other assets, vehicles, annuity and IRAs (1999 onward) and home equity less debt. Dependent variable in columns 3 and 4 is debt in 1990 dollars. All regressions include year dummies. Standard errors are in parantheses. All standard errors are heteroskadastic consistent. "Current Tenure in SE" is the interaction between current year in self-employment and being self-employed.

Table 11: Precautionary Behavior

| | [1] FE Expenditures | [2] FE Expenditures | [3] FE Expenditures |
|---|---|---|---|
| Before SE | -0.00527 | | |
| | [0.0109] | | |
| Two Year Prec | | | -0.0184 |
| | | | [0.0139] |
| One Year Prec | | -0.018 | |
| | | [0.0133] | |
| Log Spouse Wage | 0.0209*** | 0.0195*** | 0.0193*** |
| | [0.00277] | [0.00532] | [0.00532] |
| Family Size | 0.103*** | 0.0922*** | 0.0923*** |
| | [0.00403] | [0.00762] | [0.00763] |
| Observations | 23,370 | 8,553 | 8,553 |
| R-squared | 0.207 | 0.177 | 0.177 |
| No. Individuals | 2,883 | 1,716 | 1,716 |

Note: Dependent variable is log of total expenditures in 1990 dollars. "Before SE" takes on a dummy value of 1 for all periods prior to entering SE for the first time for individuals who eventually switch into SE. "One Year Prec" takes on a dummy value of 1 in the one year prior to entry into SE. "Two Year Prec" takes on a dummy value of 1 in each of the two years prior to entry into SE. Fixed effects are at the individual level. All regressions include year dummies. Standard errors are in parantheses. All standard errors are heteroskadastic consistent. "Current Tenure in SE" is the interaction between current year in self-employment and being self-employed.

Table 12: After Self-Employment

| | [1] FE Expenditures | [2] FE Expenditures | [3] FE Expenditures | [4] FE Wage | [5] FE Wage |
|---|---|---|---|---|---|
| SE Onward | 0.00527 | -0.0520*** | -0.0382** | -0.256*** | -0.664*** |
| | [0.0109] | [0.0161] | [0.0174] | [0.0286] | [0.139] |
| SE Onward* Yrs Sch | | | | | 0.0307*** |
| | | | | | [0.0105] |
| Experience | | | | 0.0315*** | 0.0338*** |
| | | | | [0.00741] | [0.00737] |
| Experience Sq | | | | -0.00114*** | -0.00111*** |
| | | | | [0.000105] | [0.000107] |
| Log Spouse Wage | 0.0209*** | 0.0277*** | 0.0279*** | -0.00835 | -0.00815 |
| | [0.00277] | [0.00379] | [0.00402] | [0.00710] | [0.00708] |
| Family Size | 0.103*** | 0.100*** | 0.102*** | 0.00341 | 0.00254 |
| | [0.00403] | [0.00488] | [0.00478] | [0.00865] | [0.00856] |
| Observations | 23,370 | 15,292 | 12,751 | 13,008 | 12,983 |
| R-squared | 0.207 | 0.188 | 0.222 | 0.08 | 0.083 |
| No. Individuals | 2,883 | 2,354 | 2,137 | 1,960 | 1,953 |

Note: Dependent variable in columns [1], [2] and [3], is the log of total expenditures in 1990 dollars. "SE Onward" takes on a dummy value of 1 for all periods after first entry into SE in column [1]. In column [2], "SE Onward" takes on a dummy of 1 in all periods after first entry into SE where the individual doesn't appear as self-employed. In columns [3] to [5], "SE Onward" takes on a dummy of 1 in all periods after first entry into SE where the individual appears as wage-employed. Dependent variable in columns [4] and [5] is the log of annual income. Fixed effects are at the individual level. All regressions include year dummies. Standard errors are in parantheses. All standard errors are heteroskadastic consistent.

Table 13: Hours Worked

| | [1] FE Hours | [2] FE Hours | [3] FE Hours | [4] OLS Hours | [5] OLS Hours | [6] OLS Hours |
|---|---|---|---|---|---|---|
| Self Employed | 0.0320*** | -0.0642*** | 0.0263** | 0.0978*** | 0.0645*** | -0.0119 |
| | [0.0110] | [0.0182] | [0.0127] | [0.00580] | [0.00937] | [0.0124] |
| Current Tenure in SE | | 0.0115*** | | | | 0.00958*** |
| | | [0.00170] | | | | [0.000765] |
| Total Tenure in SE | | | 0.00133 | | 0.00561*** | |
| | | | [0.00139] | | [0.000999] | |
| Experience | 0.0126*** | 0.0123*** | 0.0126*** | 0.00831*** | 0.00826*** | 0.00793*** |
| | [0.00244] | [0.00243] | [0.00244] | [0.000678] | [0.000677] | [0.000677] |
| Experience Sq | -0.000432*** | -0.000426*** | -0.000434*** | -0.000242*** | -0.000244*** | -0.000237*** |
| | [3.23e-05] | [3.21e-05] | [3.26e-05] | [1.64e-05] | [1.64e-05] | [1.63e-05] |
| Married | 0.0133 | 0.0134 | 0.0133 | 0.0301*** | 0.0300*** | 0.0304*** |
| | [0.00969] | [0.00967] | [0.00969] | [0.00950] | [0.00950] | [0.00950] |
| Log spouse Wage | -0.00804*** | -0.00799*** | -0.00802*** | 0.00108 | 0.00126 | 0.0015 |
| | [0.00228] | [0.00228] | [0.00228] | [0.00159] | [0.00159] | [0.00159] |
| Family Size | 0.000452 | 0.000385 | 0.000443 | 0.00403*** | 0.00411*** | 0.00403*** |
| | [0.00271] | [0.00270] | [0.00271] | [0.00143] | [0.00143] | [0.00143] |
| HS Dropout | | | | -0.0518*** | -0.0502*** | -0.0484*** |
| | | | | [0.00636] | [0.00637] | [0.00636] |
| HS Graduate | | | | -0.0122*** | -0.0118*** | -0.0112*** |
| | | | | [0.00409] | [0.00408] | [0.00408] |
| College Grad | | | | 0.0183*** | 0.0183*** | 0.0181*** |
| | | | | [0.00477] | [0.00477] | [0.00476] |
| Grad Sch | | | | -0.00359 | -0.00439 | -0.00557 |
| | | | | [0.00555] | [0.00555] | [0.00555] |
| White | | | | 0.0174** | 0.0166** | 0.0156** |
| | | | | [0.00769] | [0.00768] | [0.00766] |
| Black | | | | -0.0437*** | -0.0443*** | -0.0442*** |
| | | | | [0.00831] | [0.00831] | [0.00829] |
| Constant | | | | 7.571*** | 7.574*** | 7.574*** |
| | | | | [0.0226] | [0.0226] | [0.0226] |
| Observations | 70,233 | 70,233 | 70,233 | 70,233 | 70,233 | 70,233 |
| R-squared | 0.026 | 0.027 | 0.026 | 0.032 | 0.032 | 0.034 |
| No. Individuals | 9,756 | 9,756 | 9,756 | | | |

Note: Dependent variable is the log of annual hours worked. Fixed effects (FE) are at the individual level. All regressions include year dummies. Standard errors are in parentheses. All standard errors are heteroskadastic 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.

# 8 Graphs

Figure 1: Kernel Density Plot of Annual Earnings in 1984

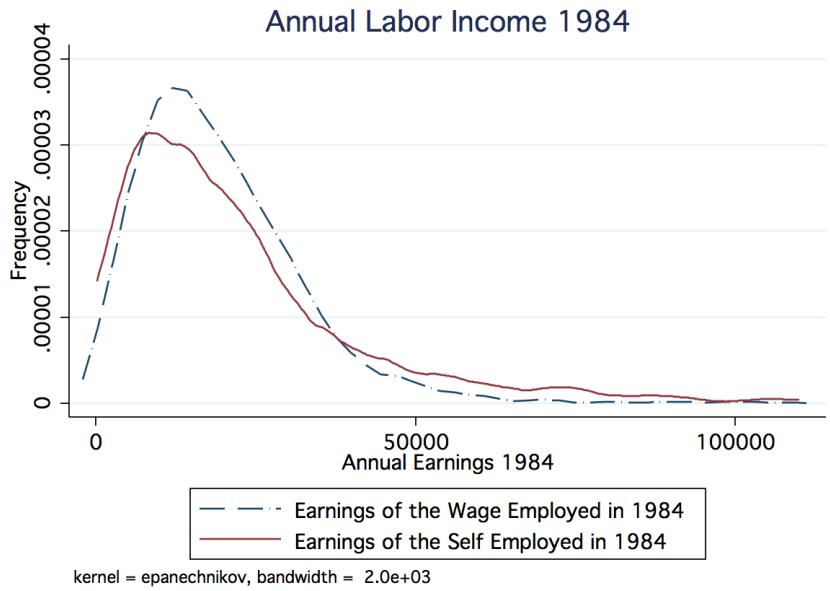



Figure 2: Kernel Density Plot of Expenditure in 1984

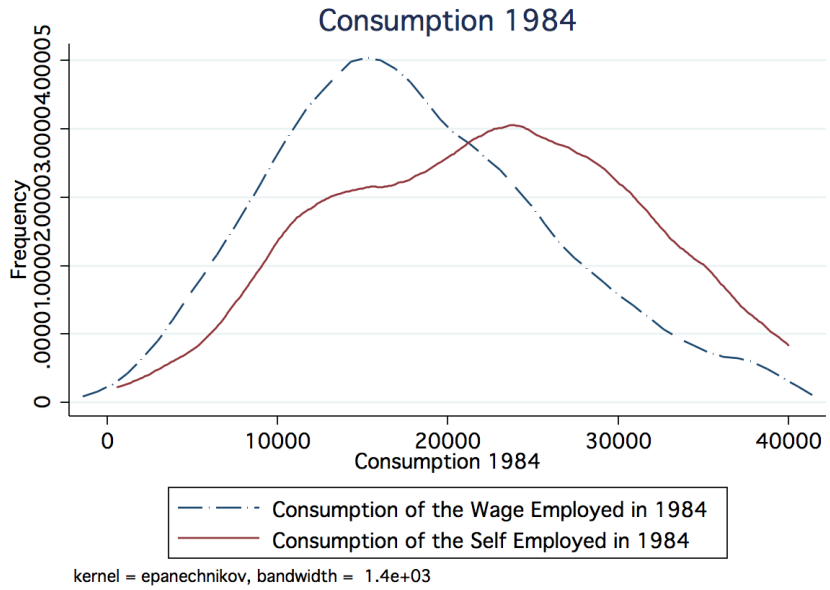


Figure 3: Kernel Density Plot of Annual Earnings in 2005

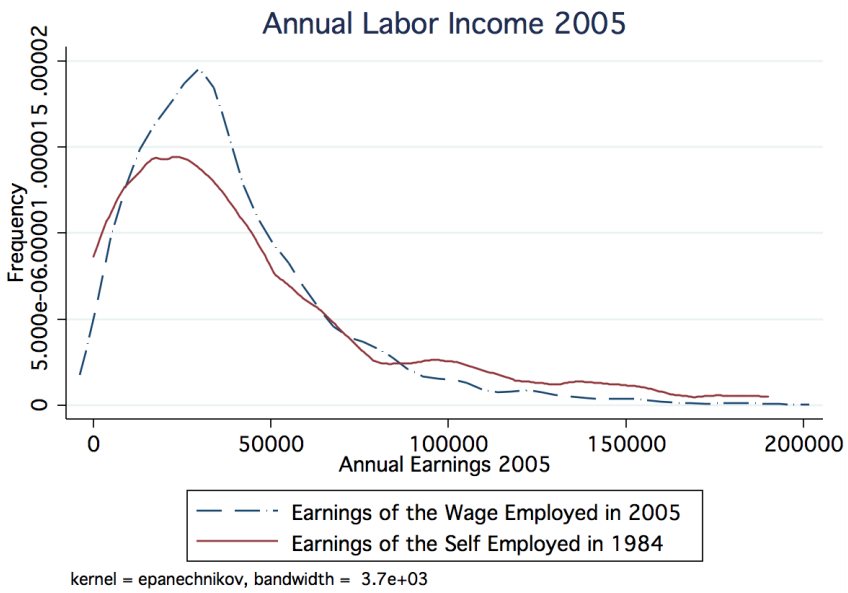
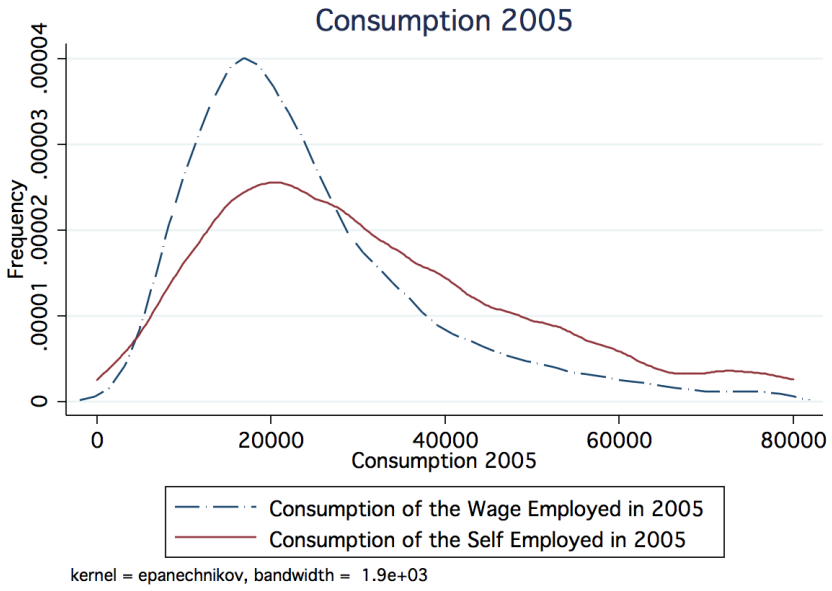



Figure 4: Kernel Density Plot of Expenditure in 2005



# A Appendix

Figure 5: Kernel Density Plot of Hourly Wage in 1984

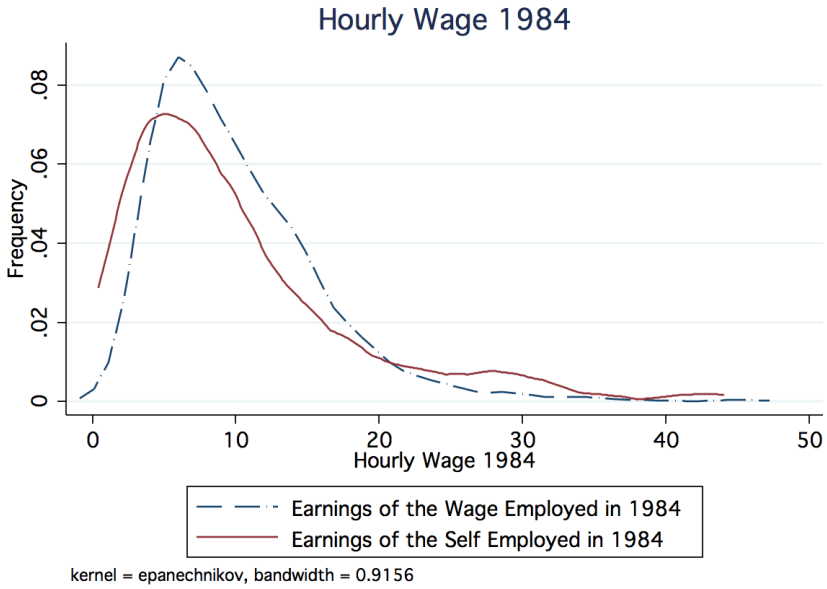



Figure 6: Kernel Density Plot of Hourly Wage in 2005

# Table 14: Expenditure Robustness

| | [1] FE Consumption (v1) | [2] OLS Consumption (v1) | [3] FE Consumption (v2) | [4] OLS Consumption (v2) | [5] FE Food Only | [6] OLS Food Only |
|---|---|---|---|---|---|---|
| Self Employed | 0.0371*** | 0.159*** | 0.0479*** | 0.137*** | 0.0235*** | 0.0983*** |
| | [0.0135] | [0.00905] | [0.00883] | [0.00641] | [0.00812] | [0.00551] |
| Experience | 0.0256*** | 0.0311*** | 0.0209*** | 0.0304*** | 0.0215*** | 0.0274*** |
| | [0.00433] | [0.00101] | [0.00252] | [0.000610] | [0.00290] | [0.000636] |
| Experience Sq | -0.000510*** | -0.000457*** | -0.000472*** | -0.000474*** | -0.000539*** | -0.000447*** |
| | [4.30e-05] | [2.21e-05] | [2.39e-05] | [1.34e-05] | [2.54e-05] | [1.41e-05] |
| HS Dropout | | -0.245*** | | -0.250*** | | -0.147*** |
| | | [0.00983] | | [0.00578] | | [0.00600] |
| HS Graduate | | -0.118*** | | -0.105*** | | -0.0636*** |
| | | [0.00621] | | [0.00422] | | [0.00420] |
| College Grad | | 0.156*** | | 0.139*** | | 0.0912*** |
| | | [0.00811] | | [0.00566] | | [0.00520] |
| Grad Sch | | 0.196*** | | 0.173*** | | 0.0955*** |
| | | [0.00838] | | [0.00590] | | [0.00546] |
| Married | 0.217 | 0.152 | 0.246* | 0.133* | 0.186*** | 0.325*** |
| | [0.182] | [0.102] | [0.141] | [0.0744] | [0.0546] | [0.0215] |
| Log spouse Wage | 0.0269*** | 0.0788*** | 0.0235*** | 0.0692*** | 0.0692*** | 0.0421*** |
| | [0.00324] | [0.00257] | [0.00208] | [0.00170] | [0.00170] | [0.00127] |
| famsize | 0.0640*** | 0.0562*** | 0.0541*** | 0.0492*** | 0.0933*** | 0.0921*** |
| | [0.00426] | [0.00232] | [0.00256] | [0.00140] | [0.00278] | [0.00146] |
| White | | 0.00613 | | 0.0206** | | 0.0196** |
| | | [0.0123] | | [0.00853] | | [0.00761] |
| Black | | -0.205*** | | -0.212*** | | -0.177*** |
| | | [0.0131] | | [0.00955] | | [0.00821] |
| Constant | | 8.586*** | | 8.734*** | | 7.346*** |
| | | [0.107] | | [0.0772] | | [0.0297] |
| Observations | 27,076 | 27,076 | 42,798 | 42,798 | 74,009 | 74,009 |
| R-squared | 0.181 | 0.311 | 0.279 | 0.379 | 0.123 | 0.213 |
| No. Individuals | 7,128 | | 8,584 | | 11,717 | |

Note: Dependent variable is the log of consumption (various versions) in 1990 dollars. Fixed effects (FE) are at the individual level. Consumption (v1) uses weights proposed in Skinner 1987 and computes consumption using food at home and outside, home value, annual rent, utilities and vehicles owned. Consumption (v2) uses weights proposed in Skinner 1987 and computes consumption using food at home and outside, home value, annual rent and nehicles owned. Columns 4 and 5 use only expenditures on food at home and away. All regressions include year dummies. Standard errors are in parentheses. All standard errors are heteroskadastic consistent. Omitted education category is college dropouts, and omitted race category is "other".

Table 15: Wealth Log Transformed

| | [1] FE Wealth | [2] FE Wealth | [3] OLS Wealth |
|---|---|---|---|
| Self Employed | 0.0747*** | 0.0315** | 0.139*** |
| | [0.0157] | [0.0158] | [0.00703] |
| Current Tenure in SE | | 0.0102*** | |
| | | [0.00199] | |
| Age | 2.99E-05 | -2.22E-05 | 0.00353*** |
| | [0.00306] | [0.00306] | [0.000122] |
| Log Spouse Wage | -0.00274 | -0.00247 | 0.00872*** |
| | [0.00246] | [0.00248] | [0.00141] |
| Married | 0.0237 | 0.0203 | 0.0428*** |
| | [0.0165] | [0.0177] | [0.00911] |
| Family Size | -0.000538 | -0.000249 | -0.00359*** |
| | [0.00202] | [0.00199] | [0.00102] |
| HS Dropout | | | -0.0426*** |
| | | | [0.00315] |
| HS Grad | | | -0.0177*** |
| | | | [0.00256] |
| College Grad | | | 0.0308*** |
| | | | [0.00636] |
| Grad Sch | | | 0.0540*** |
| | | | [0.00598] |
| White | | | 0.0252*** |
| | | | [0.00343] |
| Black | | | -0.00416 |
| | | | [0.00349] |
| Constant | | | 13.41*** |
| | | | [0.0167] |
| Observations | 19,850 | 19,850 | 19,850 |
| R-squared | 0.052 | 0.06 | 0.134 |
| No. Individuals | 7,402 | 7,402 | |

Note: Dependent variable is log transformed wealth (without home equity) in 1990 dollars. The wealth measure is the sum of the value of business, checking and savings, stocks and bonds, other assets, vehicles, annuity and IRAs (1999 onward) less debt. All regressions include year dummies. Standard errors are in parantheses. All standard errors are heteroskadastic consistent. Ommited education category is college dropouts, and omitted arce category is "other". "Current Tenure in SE" is the interaction between current year in self-employment and being self-employed.

Table 16: Wealth Without Business and Debt Log transformed

| | [1] FE Wealth (less business) | [2] FE Wealth (less business) | [3] FE Debt | [4] FE Debt |
|---|---|---|---|---|
| Self Employed | 0.0328** | 0.00748 | 0.0581 | 0.072 |
| | [0.0134] | [0.0132] | [0.151] | [0.183] |
| Current Tenure in SE | | 0.00597*** | | -0.00328 |
| | | [0.00154] | | [0.0262] |
| Age | 0.00312 | 0.00309 | -0.015 | -0.015 |
| | [0.00284] | [0.00284] | [0.0926] | [0.0926] |
| Log Spouse Wage | -0.00376* | -0.00361* | 0.0447 | 0.0447 |
| | [0.00215] | [0.00216] | [0.0390] | [0.0390] |
| Married | 0.0351 | 0.033 | -0.496 | -0.495 |
| | [0.0238] | [0.0248] | [0.952] | [0.952] |
| Family Size | 0.00547*** | 0.00564*** | -0.0585 | -0.0586 |
| | [0.00180] | [0.00178] | [0.0413] | [0.0413] |
| Observations | 19,850 | 19,850 | 19,850 | 19,850 |
| R-squared | 0.093 | 0.096 | 0.004 | 0.004 |
| No. Individuals | 7,402 | 7,402 | 7,402 | 7,402 |

Note: Dependent variable in columns 1 and 2 is log transformed wealth (less business value) in 1990 dollars. The wealth measure is the sum of the value of checking and savings, stocks and bonds, other assets, vehicles, annuity and IRAs (1999 onward) and home equity less debt. Dependent variable in columns 3 and 4 is log transformed debt. All regressions include year dummies. Standard errors are in parantheses. All standard errors are heteroskadastic consistent. "Current Tenure in SE" is the interaction between current year in self-employment and being self-employed.

Table 17: Wealth Cube Root Transformed

| | [1] FE Wealth | [2] FE Wealth | [3] OLS Wealth |
|---|---|---|---|
| Self Employed | 6.539*** | 4.451*** | 14.91*** |
| | [0.924] | [1.030] | [0.595] |
| Current Tenure in SE | | 0.481*** | |
| | | [0.141] | |
| Age | 0.0983 | 0.0967 | 0.763*** |
| | [0.327] | [0.327] | [0.0136] |
| Log Spouse Wage | 0.274 | 0.288 | 2.511*** |
| | [0.206] | [0.207] | [0.155] |
| Married | 5.538 | 5.361 | 7.179** |
| | [4.457] | [4.530] | [2.920] |
| Family Size | 1.202*** | 1.217*** | 0.1 |
| | [0.183] | [0.181] | [0.114] |
| HS Dropout | | | -10.34*** |
| | | | [0.434] |
| HS Grad | | | -3.820*** |
| | | | [0.319] |
| College Grad | | | 6.062*** |
| | | | [0.479] |
| Grad Sch | | | 8.702*** |
| | | | [0.562] |
| White | | | 5.045*** |
| | | | [0.477] |
| Black | | | -4.048*** |
| | | | [0.505] |
| Constant | | | -25.40*** |
| | | | [3.316] |
| Observations | 18,254 | 18,254 | 18,254 |
| R-squared | 0.213 | 0.215 | 0.361 |
| No. Individuals | 6,951 | 6,951 | |

Table 18: Wealth Without Business Cube Root Transformed

| | [1] FE Wealth (less business) | [2] FE Wealth (less business) |
|---|---|---|
| Self Employed | 2.146*** | 0.975 |
| | [0.678] | [0.792] |
| Current Tenure in SE | | 0.269** |
| | | [0.119] |
| Age | 0.0497 | 0.049 |
| | [0.299] | [0.299] |
| Log Spouse Wage | 0.222 | 0.23 |
| | [0.186] | [0.187] |
| Married | 4.918 | 4.82 |
| | [4.512] | [4.555] |
| Family Size | 1.254*** | 1.263*** |
| | [0.164] | [0.163] |
| Observations | 18,210 | 18,210 |
| R-squared | 0.23 | 0.231 |
| No. Individuals | 6,934 | 6,934 |

Note: Dependent variable in columns 1 and 2 is the cube root of wealth (less business value) in 1990 dollars. The wealth measure is the sum of the value of checking and savings, stocks and bonds, other assets, vehicles, annuity and IRAs (1999 onward) and home equity less debt. Dependent variable in columns 3 and 4 is debt in 1990 dollars. All regressions include year dummies. Standard errors are in parantheses. All standard errors are heteroskadastic consistent. "Current Tenure in SE" is the interaction between current year in self-employment and being self-employed.

Table 19: Linking Income and Expenditure

| | [1] FE Consumption in SE | [2] FE Consumption in WE | [3] FE Consumption in SE | [4] FE Consumption in WE |
|---|---|---|---|---|
| Annual Labor Income | 0.0478*** | 0.0997*** | 0.0182*** | 0.0595*** |
| | [0.00753] | [0.00378] | [0.00681] | [0.00458] |
| Experience | | | 0.0470*** | 0.0130*** |
| | | | [0.00961] | [0.00288] |
| Experience Sq | | | -0.000665*** | -0.000429*** |
| | | | [8.99e-05] | [2.76e-05] |
| Married | | | 0.0821* | 0.246*** |
| | | | [0.0492] | [0.0134] |
| Log spouse Wage | | | 0.00980* | 0.0161*** |
| | | | [0.00555] | [0.00212] |
| Family Size | | | 0.0694*** | 0.0641*** |
| | | | [0.00823] | [0.00268] |
| Observations | 12,135 | 111,339 | 6,527 | 52,399 |
| R-squared | 0.069 | 0.076 | 0.19 | 0.223 |
| No. Individuals | 3,299 | 16,253 | 1,903 | 8,938 |

Note: Dependent variable is consumption by employment category. Fixed effects (FE) are at the individual level. Annual income is measured in 1990 dollars. All regressions include year dummies. Standard errors are in parentheses. All standard errors are heteroskadastic consistent.