

**CEP Discussion Paper No 1237**

**August 2013**

**Smart and Illicit: Who Becomes an Entrepreneur and  
Does it Pay?**

**Ross Levine and Yona Rubinstein**

## **Abstract**

We disaggregate the self-employed into incorporated and unincorporated to distinguish between “entrepreneurs” and other business owners. The incorporated self-employed have a distinct combination of cognitive, noncognitive, and family traits. Besides coming from higher-income families with better-educated mothers, the incorporated - as teenagers - scored higher on learning aptitude tests, had greater self-esteem, and engaged in more aggressive, illicit, risk-taking activities. The combination of “smarts” and “aggressive/illicit/risk-taking” tendencies as a youth accounts for both entry into entrepreneurship and the comparative earnings of entrepreneurs. In contrast to a large literature, we also find that entrepreneurs earn much more per hour than their salaried counterparts.

Keywords: Self-employment; Occupational choice; Compensation; Firm organization; Corporate finance; Cognitive and Noncognitive traits.

JEL Classifications: L26, J24, J3, G32

This paper was produced as part of the Centre’s Productivity Programme. The Centre for Economic Performance is financed by the Economic and Social Research Council.

## **Acknowledgements**

We thank Gary Becker, Moshe Buchinsky, David De Meza, Stephen Durlauf, Christian Dustmann, Luis Garicano, Steve Machin, Naomi Hausman, Chinhui Juhn, Ed Lazear, Gustavo Manso, Casey Mulligan, Ignacio Palacios-Huerta, Luis Rayo, Ivo Welch, and seminar participants at the IDC, London School of Economics, NBER Summer Institute, Simon Fraser University, University of California-Berkeley, University College-London, and the University of Minnesota for helpful comments. Rubinstein thanks STICERD for financial support.

Ross Levine Haas School of Business at the University of California, Berkeley; the Milken Institute; and the NBER, [ross\\_levine@haas.berkeley.edu](mailto:ross_levine@haas.berkeley.edu). Yona Rubinstein, London School of Economics, CEP, and the CEPR, [y.rubinstein@lse.ac.uk](mailto:y.rubinstein@lse.ac.uk).

Published by  
Centre for Economic Performance  
London School of Economics and Political Science  
Houghton Street  
London WC2A 2AE

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission in writing of the publisher nor be issued to the public or circulated in any form other than that in which it is published.

Requests for permission to reproduce any article or part of the Working Paper should be sent to the editor at the above address.

© R. Levine and Y Rubinstein, submitted 2013

# I Introduction

Economists since Adam Smith (1776) have emphasized that profit-motivated entrepreneurs spur innovation and improvements in living standards. According to this view, entrepreneurs undertake costly and risky investments to develop better goods, services, and production processes, with corresponding effects on factor markets and economic growth.<sup>1</sup>

Yet, a substantial body of research - using data on the self-employed to draw inferences about entrepreneurship - concludes that entrepreneurship does not pay (e.g., Borjas and Bronars 1989; Evans and Leighton 1989; and Hamilton 2000). Even after accounting for the underreporting of business income, Hamilton (2000) finds that the median self-employed individual has lower initial earnings and slower earnings growth than that of a salaried worker with the same observed traits.<sup>2</sup> Since entrepreneurship apparently does not yield pecuniary returns, many argue that people are attracted into entrepreneurship by some combination of (a) the non-pecuniary benefits, such as being “one’s own boss” (Hamilton 2000; Hurst and Pugsley 2011), (b) the fat right tail of the earnings distribution associated with self-employment, and (c) the “over confidence” that entrepreneurs have in their own business acumen (Bernardo and Welch 2001; De Meza and Southey 1996; Dawson, De Meza, Henley, and Arabsheibani, 2011).

The puzzle goes beyond earnings. Not only are the median earnings of the self-employed comparatively low, they have similar traits to those of salaried workers. As documented below, they have similar education, score similarly on learning aptitude tests and self-esteem evaluations as teenagers, and have parents with similar education and income. If the self-employed are a good proxy for “growth-creating innovators,” it is both puzzling that their cognitive abilities and noncognitive traits are similar to those of their salaried counterparts *and* that they earn less.

Perhaps, self-employment is not a good proxy for entrepreneurship. Glaeser (2007) argues that self-employment aggregates together different types of activities and individuals, making “little distinction between Michael Bloomberg and a hot dog vendor.” While some of the self-employed are high-ability, innovative individuals who mobilized capital to create novel products and undertake risky ventures, others engage in qualitatively different business activities. For instance, Evans and Leighton (1989) hold that many self-employed are small retail business owners who did not succeed as salaried workers; they are not “growth-creating innovators.”

In this paper, we offer a new approach for creating a better proxy for entrepreneurship and use this proxy (1) to assess the cognitive, noncognitive, and family traits associated with the self-sorting of individuals into entrepreneurship and other employment types, i.e., to assess who becomes an entrepreneur and (2) to

---

<sup>1</sup>See, for example, Schumpeter (1942), Kihlstrom and Laffont (1979), Kanbur (1979), Jovanovic (1979), Holmes and Schmitz (1990), Romer (1990), and Aghion and Howitt (2009).

<sup>2</sup>Using a different approach that compares the returns to private and public equity investments, Moskowitz and Vissing-Jorgensen (2002) also find that entrepreneurship typically fails to yield pecuniary returns.

evaluate the Mincerian returns to entrepreneurship, i.e., to evaluate whether entrepreneurship pays. To better identify people engaged in entrepreneurship, we disaggregate the self-employed into two groups - the incorporated and unincorporated. While past work proxies for “entrepreneurs” by distinguishing between the salaried and self-employed, we attempt to better proxy for entrepreneurs by further distinguishing between the incorporated and unincorporated self-employed. History motivates this disaggregation.

Over several centuries, people created the incorporated business structure with the explicit goal of fostering entrepreneurship - investment in large, long-gestation, innovative, and risky activities (e.g., Chandler 1977; Harris 2000). Specifically, incorporation has two defining characteristics - limited liability and a separate legal identity—that facilitate entrepreneurship. Limited liability reduces the potential downside losses to equity holders, increasing the appeal of purchasing equity in high-risk, high-expected return projects. A separate legal identity means that corporations can own property and enter into contracts independently of shareholders. This means that shareholder-specific shocks are less likely to disrupt firm activities, increasing the appeal of investing in large, long-gestation projects.

Incorporation is not appropriate for all businesses, however. Besides the additional direct costs of incorporation, such as charting and annual fees and the preparation of more elaborate financial and disclosure statements, considerable research focuses on the indirect agency costs created by the separation of ownership and control (e.g., Berle and Means 1932, Meckling and Jensen 1976, Fama 1980, and Myers and Majluf 1984). Therefore, when people initiate less innovative, smaller, and shorter-gestation activities that do not benefit much from the limited liability and independent legal identity traits of the corporation, they are more likely to select the unincorporated form. Below, we present evidence supporting our maintained hypothesis that the choice of the incorporated or unincorporated business structure reflects the ex ante nature of planned activities and not merely the ex post performance of businesses.

To examine who becomes an entrepreneur and whether it pays, we use the March Supplements of the Current Population Survey (CPS) and the National Longitudinal Survey of Youth, 1979 (NLSY79). Although the CPS surveys a larger cross-section of individuals, the NLSY79 traces individuals through time, so that we can decompose earnings into individual and employment-type effects (e.g., incorporated, unincorporated, and salaried). Also, the NLSY79 has information on cognitive, noncognitive, and family traits before individuals become prime age workers, including data on learning aptitude (AFQT score), personality traits, such as self-esteem, and the degree to which the individual engages in illicit activities. We use this information to study sorting into the different employment types on these traits and the returns to these traits in each employment type.

We find that the incorporated self-employed earn much more per hour and work many

more hours than the salaried and unincorporated. After conditioning on standard Mincerian characteristics, the incorporated self-employed have average residual hourly earnings that are 48% greater and median residual earnings that are 28% greater than their salaried counterparts. We also find that the median unincorporated individual earns less per hour than his salaried counterpart and much less than a comparable incorporated worker. This helps explain the puzzle concerning the negative pecuniary returns to self-employment: the incorporated earn more than salaried workers, the unincorporated earn less, and there are more unincorporated than incorporated individuals.

Although the higher earnings of the incorporated self-employed partially reflect returns to individual traits, there is an additional increase in residual earnings associated with the actual switch into incorporated self-employment. Individuals that incorporate at some point in their lives earn about 30% more on average as salaried workers than comparable salaried workers who never incorporate: some people have traits associated with both higher earnings, regardless of employment type, and a greater tendency to incorporate. Nevertheless, when controlling for individual effects, individual-trend effects, and many additional robustness tests, workers enjoy an 18% boost in average residual hourly earnings when switching from salaried to incorporated self-employment. Thus, this is the first paper to show that entrepreneurs tend (1) to be successful salaried workers before becoming incorporated self-employed and (2) to enjoy an additional boost in earnings when they become entrepreneurs. It is a small group of successful salaried workers with a particular constellation of cognitive, noncognitive, and family traits that become incorporated self-employed.

The results are very different for the unincorporated self-employed. People that become unincorporated self-employed during their careers tend to earn less as salaried workers than comparable salaried workers that never become self-employed. While there is positive sorting on salaried earnings into incorporated self-employment, it is the comparably unsuccessful salaried workers that sort into unincorporated self-employment.

The distribution of the residual hourly earnings of the self-employed, especially the incorporated self-employed, has much fatter tails than that of salaried workers, suggesting that there is a large option value associated with entrepreneurship. For example, people that are successful when they are incorporated (90th-percentile of the residual hourly earnings distribution of the incorporated) tend to enjoy 70 percent more earnings than their earnings as successful salaried workers (90th-percentile of the residual hourly earnings distribution of the salaried). Although we do not assess the risk adjusted investment returns to starting a business, as we do not account for the full array of costs and risks, we do show that earnings distributions differ markedly across employment types and the residual hourly earnings distribution of the incorporated has notably fat tails. Entrepreneurship offers the possibility of

comparably enormous increases in earnings.

There is strong sorting into employment types based on cognitive and noncognitive traits. The incorporated are more educated and more likely to come from high-earning, two-parent families than salaried workers. Furthermore, even as teenagers, people that incorporate later in life tend to score higher on learning aptitude tests, exhibit greater self-esteem, indicate that they aspire to be managers/leaders later in life, and engage in more aggressive, illicit, and risky activities than other people.

Moreover, it is a particular *mixture* of pre-labor market traits that is most powerfully associated with entrepreneurship.<sup>3</sup> People who *both* engaged in illicit activities as teenagers and scored highly on learning aptitude tests have a much higher tendency to become entrepreneurs than others without this particular mixture of traits. The unincorporated are very different. While on average the unincorporated engaged in more illicit activities as youths than salaried workers, they did not tend to score higher on learning aptitude tests. Therefore, aggregating all self-employed together would mistakenly lead to the conclusion that it is the “not too smart” individuals who heavily engage in illicit activities that become entrepreneurs. Rather, it is the particular mixture of “smart” *and* “illicit” characteristics that accounts for entry into incorporated self-employment.

We also discover that many of the same cognitive and noncognitive traits that explain sorting into incorporated self-employment also account for the differential earnings association with becoming an incorporated business owner, suggesting a link between the expected returns to entrepreneurship and the tendency to become an entrepreneur. People with *both* the skills to succeed as salaried employees *and* the inclination to break-the-rules (as measured by illicit activities as a youth) tend receive much larger increases in earnings when they become incorporated self-employed business owners than people without that combination of traits. Yet, this combination of traits does not account for comparative success in salaried employment or unincorporated self-employment. While past research shows the importance of noncognitive traits for labor market outcomes (Bowles et al. 2001; Heckman and Rubinstein, 2001; Heckman et al. 2006; Heckman, 2000), we document that some mixtures of traits are more highly remunerated in incorporated self-employment than in other employment types.

A range of evidence supports our hypothesis that the choice of creating an incorporated or unincorporated business reflects the planned business activity, not simply it’s ex post performance. First, one might argue that successful unincorporated businesses eventually

---

<sup>3</sup>We are not the first to stress that entrepreneurship involves a special mixture of skills. Lazear (2004, 2005) explains that entrepreneurs must be jacks-of-all-trades that have the skills to marshal all of the factors of production efficiently. We empirically demonstrate how particular pre-labor market traits explain entry both into entrepreneurship and success as an entrepreneur.

incorporate, for tax or other reasons, while unsuccessful ones do not. If this were the case, we should observe that a large proportion of the incorporated were first successful unincorporated business owners. But, this is not the case. Only 0.1 percent of the unincorporated self-employed incorporate annually. Second, if incorporation simply reflected earlier success, then we should observe an increase in earnings before a person switches into incorporation. But, this is not the case either. Third, individuals who choose to incorporate (a) have distinct cognitive and noncognitive traits *before* they enter the labor market and (b) work many more hours after incorporating. Fourth, the incorporated view themselves as entrepreneurs to a greater degree than the unincorporated. When NLSY79 asks individuals whether they are “entrepreneurs,” i.e., whether they launched a business enterprise with considerable initiative and risk, 66% of the incorporated respond that they are entrepreneurs, compared to only 45% of the unincorporated. Fifth, those that incorporate are more than twice as likely to have contributed work leading to a patent application as other individuals. These findings suggest that incorporation is not merely the result of high earnings; rather, people seem to choose whether to organize as incorporated or unincorporated businesses based on their planned business activities, and these plans are in turn shaped by several factors, including their pre-labor market traits.

It is valuable to clarify that we do not evaluate the average impact of incorporation on earnings. That is, we do not - and do not seek to - assess the impact of randomly making a typical person incorporated self-employed. Indeed, we show that those who choose to become incorporated self-employed are not typical; they have very distinct cognitive, noncognitive, and family traits and these traits pay positive Mincerian returns when employed in incorporated self-employment.

The paper is organized as follows. Section II discusses how corporations facilitate entrepreneurship. Sections III and IV analyze the CPS and NLSY79 data, respectively. Section V evaluates the distributions of hourly earnings and Section VI examines the differential returns to cognitive and noncognitive traits by employment type. In Section VII, we sketch a model that frames our empirical findings about the sorting of individuals into different employment types and the comparative earnings associated with this self-sorting. Section VIII concludes.

## II Incorporated and Unincorporated Business Structures

The incorporated business structure has two quintessential characteristics: a separate legal identity and limited liability. Having a separate legal identity means the corporation can (a) enter into contracts and own property independently of its owners, (b) survive longer than

any particular owner, and (c) operate with few disruptions even when shares are traded. Having limited liability means owners are not fully responsible for the debts and other obligations of the firm.

These characteristics can foster entrepreneurial activities. Since potential purchasers of equity find it unappealing to assume unlimited liability for a firm's obligations, limited liability can increase the attractiveness of purchasing equity, especially shares in more opaque, riskier businesses. And, if a business has a separate legal identity from its owners, ownership can change without disrupting firm operations. Thus, idiosyncratic shocks affecting particular owners are less likely to hinder the continuity of the business, increasing the appeal of investing in it.

People developed these characteristics of the incorporated business structure over several centuries for the explicit purpose of facilitating entrepreneurship, as discussed in Braudel (1982), Chandler (1954, 1965, 1977), Goetzmann and Rowenhorst (2005), Harris (2000), Lopez (1976), and Malmendier (2009). While corporate taxes might differ along some dimensions, the historical record shows that taxes did not drive the creation and use of incorporated enterprises (Baskin and Miranti 1997; Harris, 2000). Rather, the incorporated business form is the result of the pragmatic, entrepreneur-led push to create a legal organization more conducive to innovative, risky activities than unincorporated businesses.

Research also emphasizes the costs of incorporation. Incorporation typically involves greater direct costs, such as chartering costs, annual fees, preparing more elaborate financial statements, organizing board meetings, keeping records of those meetings, and satisfying unemployment insurance payments. Incorporation also tends to increase indirect costs, including agency and organizational complexities. From Adam Smith (1776) to Berle and Means (1932) to modern corporate finance theory, economists have stressed that limited liability and the separation of ownership from control intensify an array of frictions.

Consequently, we expect that people select the incorporated or unincorporated business form based on the planned nature of their business activities. For example, when a person starting a business views the potential benefits from incorporation - limited liability and a separate legal entity - as more important for the functioning of the business than the potential costs, the person will choose the incorporated form. Therefore, we interpret the choice of incorporated self-employment as signaling, albeit imperfectly, the undertaking of entrepreneurial activities, and the choice of the unincorporated business form as indicating the undertaking of different types of activities.

For these reasons - and others discussed below, we use the incorporated self-employed as a proxy for "entrepreneurs" and argue that it is a better proxy for entrepreneurship than the conventional approach of using the aggregate group of incorporated and unincorporated



self-employed. We do not argue that all incorporated self-employed individuals engage in novel, risky, large, and long-gestation projects. And, we do not claim that no salaried or unincorporated self-employed individuals engage in entrepreneurial activities. Rather, we hold that incorporation was created to facilitate novel, risky activities and hence people initiating such entrepreneurial activities are more likely to choose this business form than people initiating other types of businesses. In turn, given the added direct and indirect costs associated with incorporation, the plumber, electrician, and carpenter undertaking less novel businesses will tend to choose the unincorporated business form.

### **III Earnings and Characteristics of Different Employment Types: CPS**

#### **III.a Data and Summary Statistics**

In this section, we take a first glance at the sorting of individuals into different employment types - salaried, unincorporated self-employed, and incorporated self-employed - and their earnings using the March Annual Demographic Survey files of the CPS for the work years 1994 through 2010. We start in 1994 because the measure of incorporation changed following the redesign of the CPS in 1994 (Hipple 2010) and the period starting in 1994 corresponds closely to the relevant years from the NLSY79. For the summary statistics, we include prime age workers (25 through 55 years old) who do not: live within group quarters, have missing data on relevant demographics, work in agriculture or the military, or have allocated earnings. Consistent with much research, the sample used for earnings regressions includes only white, non-Hispanic males.

The CPS classifies all workers in each year as either salaried or self-employed, and among the self-employed, they indicate whether the person is incorporated or unincorporated self-employed. Specifically, individuals are asked about their employment class for their main job: “Were you employed by a government, by a private company, a nonprofit organization, or were you self-employed (or working in a family business)?” Those responding that they are self-employed are further asked, “Is this business incorporated?”<sup>4</sup> In terms of occupation, about half of the incorporated self-employed are managers and no other three digit occupation accounts for more than 3.5% of the incorporated self-employed. Physicians

---

<sup>4</sup>With respect to legal and tax definitions, there are many types of corporations and hybrid institutions. Most typically, C corporations are taxed separately from their owners. S corporations have no more than 100 shareholders and all income is passed through to shareholders for tax purposes. In terms of hybrid institutions, there are limited liability limited partnerships, limited liability partnerships, limited partnerships, etc. Conceptually, for this paper, incorporation involves limited liability and a separate legal identity. Empirically, the CPS and NLSY79 provide the self-reported classifications.

and surgeons (3.3%), lawyers (3.3%), and accountants (1.3%) combine to account for less than 8% of incorporated self-employment. With respect to the unincorporated, about 25% are managers. Carpenters (9.2%), truck drivers (4.6%), and automobile mechanics (3.5%) combine to account for about 17% of unincorporated self-employment.

Table 1 provides summary statistics about the age, race, gender, education, and labor market outcomes of individuals reported as working while distinguishing among salaried workers, all self-employed workers, the unincorporated self-employed, and the incorporated self-employed. Hourly earnings are defined as real annual earnings divided by the product of weekly working hours and annual working weeks, where the Consumer Price Index is used to deflate earnings to 2010 dollars. All CPS calculations are weighted using the March supplement weights.

Consistent with earlier findings, Table 1 shows that compared to the aggregate group of self-employed individuals, salaried workers earn more per hour, work about the same number of hours, and have similar educational attainment. For example, salaried workers have on average 13.7 years of education, while the self-employed have 13.9. These summary statistics confirm the puzzle emerging from the extant literature: If entrepreneurship drives technological innovation and growth, it is odd that the self-employed, which are often used to draw inferences about entrepreneurship, earn less, work the same number of hours, and have similar traits as salaried workers.

In contrast to past work, our demarcation between incorporated and unincorporated self-employment highlights two differences. First, the median incorporated self-employed worker earns much more per hour - and works many more hours - than the median salaried and unincorporated individual. Indeed, median hourly earnings of the incorporated are about 80 percent greater than that of the unincorporated self-employed and 33 percent more than salaried employees.

Second, the incorporated self-employed have distinct demographic and educational traits. The incorporated tend to be disproportionately white, male, and highly educated. For example, while about 71 percent of prime age individuals were white during the sample period, whites account for 84 percent of the incorporated self-employed. Similarly, women account for 48 percent of the sample of workers, but only 28 percent of the incorporated self-employed. Furthermore, the incorporated self-employed are much more educated than salaried workers - and more still than unincorporated workers. While 32 percent of salaried workers graduated from college, 46 percent of the incorporated self-employed had a college degree (or above) during the period from 1994 to 2010. Simply comparing salaried and self-employed workers conceals huge differences across employment types.

### III.b Transitions Across Employment Types

Besides further illustrating the sorting of individuals into different employment types, we can address a concern with our demarcation between incorporated and unincorporated self-employment: perhaps, businesses begin as unincorporated and the successful ones incorporate. If such an organizational lifecycle characterizes business, it would imply that incorporation is simply an ex post choice made by successful businesses rather than an ex ante choice made by people selecting the most effective organizational form in which to engage in distinct business activities.

Table 2 provides transition matrices for individuals across employment types. Although the CPS is not a longitudinal study, it does ask about both employment and earnings in the previous year. The CPS classifies respondents by the job that they held for the longest time during the previous year. Based on these data, we compute the transition of workers into and out of employment types. In particular, each cell of Table 2's Panel A gives the percentage of workers of a particular employment type last year that are in each particular employment type this year. The upper-left cell, therefore, indicates that 96.6 percent of workers who were salaried last year are salaried this year (during the week that they were surveyed). The next cell down indicates that 0.8% of the workers who were salaried last year are incorporated self-employed this year. Each cell of Panel B gives the median hourly earnings last year of individuals that made each transition illustrated in Panel A. Thus, the upper-left cell indicates that the median earnings of individuals last year that remained salaried this year are \$22,700. The next cell down indicates that individuals that transitioned from salaried to incorporated self-employment were higher earning salaried workers last year (\$26,800) than those that remained salaried workers. Panel C provides the median year of education last year for each transition cell.

Table 2 has two interrelated messages. First, there is positive sorting into incorporated self-employment on earnings and education and negative sorting into unincorporated self-employment on these traits. It is the comparatively high-paid, high-educated individuals that tend to transit into incorporated self-employment from salaried and unincorporated employment, and it is the relatively low-paid, low-educated people that disproportionately transit into unincorporated self-employment.

Second, very few people transit from unincorporated to incorporated self-employment. Specifically, only 0.1 percent of the unincorporated self-employed incorporate and only a small fraction of the population is unincorporated (6% as shown in Table 1). In contrast, salaried workers compose 90 percent of the working population (Table 1) and a larger fraction of these salaried workers (0.8 percent) become incorporated self-employed annually: the

bulk of the incorporated self-employed transitioned from salaried employment.<sup>5</sup> Thus, although there is positive sorting into incorporated self-employment in general - and from the unincorporated in particular, trivially few unincorporated self-employed transition into incorporated self-employment.

### III.c Residual Hourly Earnings and Different Employment Types

We now evaluate the relationship between hourly earnings and employment types while controlling for standard demographics (such as a quartic expression for potential work experience and dummy variables for six education categories), as well as year, state, industry, and occupation fixed effects.<sup>6</sup> We present the regression results for the sample of white, prime age (25-55) males, who work full-time, full-year to focus on a comparatively homogeneous sample of individuals, though the results are robust to expanding the sample. To allow for nonpositive self-employment earnings, we examine hourly earnings rather than log hourly earnings.

Table 3 presents 8 regressions, where the dependent variable is hourly earnings. For the Panel A regressions, the main explanatory variable is self-employed, which is a dummy variable that equals one if the individual is either incorporated or unincorporated self-employed and equals zero if the individual is a salaried worker. For the Panel B regressions, the main explanatory variables are incorporated and unincorporated, where incorporated (unincorporated) equals one if the individual is incorporated (unincorporated) self-employed and zero otherwise. We present OLS regressions and quantile regressions at the 25th, 50th, and 75th percentile of the hourly earnings distribution. In the OLS regressions, residuals are clustered at the state level. For the quantile regressions, the findings hold when computing the bootstrapped standard errors of the coefficient estimates based on 500 random samples with replacement.

Table 3 yields three major findings. First, consistent with past findings, the median self-employed earns less than his salaried counterpart (regression 2). For example, residual hourly earnings of the self-employed are about 15 percent lower than their salaried counterparts.

Second, the median incorporated self-employed earns more than his salaried and unincorporated counterparts, while the median residual hourly earnings of the unincorporated self-employed are substantially lower than salaried and incorporated counterparts. From

---

<sup>5</sup>We obtain the same results reported below when omitting individuals that transit between self-employment types.

<sup>6</sup>Potential work experience (pwe) equals age minus years of schooling minus seven (or zero if this computation is negative). The quartic expression includes pwe, pwe2, pwe3, and pwe4, which are included in the hourly wage regressions. The education categories are: (i) completed less than 9th grade, (ii) completed between 9th and 11th grade, (iii) graduated from high school, (iv) had some college education, (v) graduated from college, and (vi) obtained an advanced degree.

regression (6), the median residual hourly earnings of the incorporated self-employed are 3.8 percent greater than that of the median salaried worker, while the median residual hourly earnings of the unincorporated self-employed are 29.7 percent lower than that of salaried counterparts.

These two findings account for the literature’s puzzling results on self-employment. After controlling for individual characteristics, the median incorporated person earns more than his salaried counterpart, while the median unincorporated earns less. Since there are more unincorporated than incorporated self-employed, regressions that do not distinguish between these two self-employment types find that the median self-employed worker earns less than a comparable salaried worker.

Third, the earnings distribution of the incorporated self-employed has much “fatter” tails than the earnings distribution of salaried workers. To see this, first compare regressions (5) and (6). Average residual hourly earnings of the incorporated (regression 5) are about 26 percent greater than those of the average salaried worker, while median residual hourly earnings of the incorporated (regression 6) are 3.8 percent greater. Next, consider the quantile regressions (6) - (8). Residual hourly earnings of the incorporated at the 25th-percentile of the hourly earnings distribution of incorporated self-employed are about 12 percent less than those of a comparable salaried worker at the 25th-percentile of salaried earnings, but residual hourly earnings of the incorporated at the 75th-percentile of the earnings distribution for incorporated self-employed are about 22 percent more than those of a comparable salaried worker. When the incorporated are successful, they tend to be much more successful than successful salaried workers.<sup>7</sup> We return to these distributional issues below.

### III.d Discussion and Interpretation

Distinguishing between the incorporated and unincorporated provides startlingly different perspectives about entrepreneurship from those in the literature. Using incorporated in particular, rather than self-employment in general, as a proxy for entrepreneurship, we find that entrepreneurs are more highly educated, work more hours, and earn more per hour than salaried workers or the unincorporated self-employed. Further, we find positive sorting into incorporated self-employment on earnings and education, negative sorting into unincorporated self-employment on those same traits, and almost no transitions between the

---

<sup>7</sup>The same patterns hold for the unincorporated, though the entire earnings distribution is shifted to the left. For example, while median residual unincorporated earnings are 30 percent less per hour than salaried counterparts (regression 6), successful unincorporated individuals (75th-percentile of the distribution of earnings for unincorporated self-employed) earn only 14 percent less than successful salaried counterparts (75th-percentile of the distribution of earnings of salaried workers), as reported in regression (8). And, unsuccessful unincorporated individuals (25 percentile) earn a full 51 percent less per hour than unsuccessful salaried counterparts (regression 7).

incorporate and unincorporated forms of self-employment. These findings are consistent with the view that people with different traits choose the incorporated and unincorporated business form when starting different business activities.

While illustrative, the higher median residual hourly earnings of the incorporated self-employed might simply reflect unobserved (to the econometrician) traits that both yield higher earnings and increase the likelihood of incorporation. The more productive traits of the incorporated, such as higher education, suggest the possibility of non-trivial selection into incorporation based on unobservable traits. To address the degree to which observed and unobserved individual traits account for the higher earnings of the incorporated self-employed and the degree to which these differential earnings reflect the returns to different employment activities, we turn to the NLSY79.

## **IV Earnings, Characteristics, and Selection Among Employment Types: NLSY79**

In this section, we use the NLSY79 to examine the selection of individuals into the different employment types based on wide-array of cognitive, noncognitive, and family traits and then assess the change in an individual's earnings when he switches among employment types. We first describe the advantages of the NLSY79 relative to the CPS, including the NLSY79's unique information on each individual's cognitive, noncognitive, and family traits. We then turn to selection and earnings.

### **IV.a The NLSY79: Longitudinal Data and Pre-Labor Market Traits**

The NLSY79 is a representative survey of 12,686 individuals who were 15-22 years old when they were first surveyed in 1979. We use the cross-sectional sample (6,111 individuals), the supplemental samples (5,295 individuals), and the military sample (1,280 individuals). Individuals were surveyed annually through 1994 and have since been surveyed biennially. We use survey years 1979 through 2010. Since nobody in our sample is above the age of 55, the NLSY79 sample corresponds to that of the CPS analyses.<sup>8</sup>

Although the NLSY79 surveys a smaller cross section of people than the CPS, the NLSY79 has several advantages. First, since the NLSY79 traces individuals through time, we examine what happens to earnings when a person changes employment type. Furthermore,

---

<sup>8</sup>Although Fairlie (2005) and Fairlie and Meyer (1996) document the similarities between CPS and NLSY samples, we note that the NLSY draws on a younger sample of individuals. Since the incorporated self-employed are older than other employment types, a smaller percentage of the NLSY sample is incorporated than the CPS sample.

the longitudinal nature of the data means that we can address biases associated with examining cross-sectional data that does not account for how long people are in each employment type. In particular, Manso (2013) stresses that entrepreneurial experimentation, whereby successful innovators remain entrepreneurs while unsuccessful ones return to salaried employment, can explain the finding that the self-employed earn less than salaried workers when research simply examine a cross-section of workers.

Second, because almost all individuals (about 90%) work as salaried workers before they become self-employed, we examine the selection of salaried workers into incorporated and unincorporated self-employment based on their earnings as salaried workers. We assess whether it is the comparatively successful salaried workers who disproportionately sort into entrepreneurship.

Third, since the NLSY79 provides information about the traits of individuals *before* they become prime age workers, we examine the sorting of individuals into different employment types based on these pre-labor market traits.

In particular, the NLSY79 provides unique information on individual and family traits. To measure cognitive ability, we use the NLSY79's **AFQT score** (Armed Forces Qualifications Test score), which measures the aptitude and trainability of each individual. Collected during the 1980 NLSY79 survey, the AFQT score is based on information concerning arithmetic reasoning, world knowledge, paragraph comprehension, and numerical operations. It is frequently employed as a general indicator of cognitive skills and learning aptitude. This AFQT score is measured as a percentile of the NLSY79 survey, with a median value of 50.

We also use the **Rosenberg Self-Esteem score**, which is based on a ten-part questionnaire given to all NLSY79 participants in 1980. It measures the degree of approval or disapproval of one's self and has been widely used in psychology and economics (Bowles et al., 2001; Heckman et al., 2006). The values range from six to 30, where higher values signify greater self-approval.

To measure the degree to which individuals believe they have internal control of their lives through self-determination relative to the degree that external factors, such as chance, fate, and luck, shape their lives. This is measured by the **Rotter Locus of Control**, which was collected as part of a psychometric test in the 1979 NLSY79 survey. The Rotter Locus of Control ranges from four to 16, where higher values signify less internal control and more external control.

To measure the aspirations of individuals before they enter the labor markets, we use information from the following question that the NLSY79 posed in 1979: "What type of job would you most like to be trained for?" The NLSY79 provides a menu of options. **Managerial Aspirations** is set equal to one if the individual selects "managers, officials, and

proprietors,” while **Professional Aspirations** is set equal to one if the individual selects “professional, technical, and kindred.” These measures of “aspirations” are set equal to zero if the individual selects a different answer from the menu of options, such as “craftsmen, foremen, and kindred,” or “armed forces,” or “farmers,” etc.

To measure the aggressive, risk taking, “break-the-rules,” behavior of individuals, we use the **Illicit Activity Index** which measures the degree to which an individual reports engaging in illicit/delinquent activities when surveyed in 1980. The index is based on 23 questions, covering themes associated with skipping school, use of alcohol and marijuana, vandalism, shoplifting, drug dealing, robbery, assault, and gambling. For each question, we assign the value zero if the person ever engaged in that activity and zero otherwise. To obtain the index, we simply add these values and divide by 23. Thus, the Illicit Activity Index ranges from 0 to 1, with higher values signifying more illicit behaviors.<sup>9</sup> We also report results using the answers to some of the individual questions, such as whether the person ever used force to obtain things (**Force**), stole something of \$50 or less (**Steal 50 or less**), and whether the person was **Stopped by the Police**.

We use additional information on each individual’s pre-labor market family traits, including data on parental education, whether the individual lived in a two-parent family at the age of 14, and family income in 1979, measured in 2010 dollars.

The NLSY also posed new questions in 2010 that provide helpful information in assessing the validity of using the unincorporated and incorporated self-employed as indicators of the ex ante nature of the business venture. To measure the degree to which an individual consider himself to be an entrepreneur, we use **Entrepreneur**, which equals one if the respondent in 2010 answers "yes" to the question, "Do you consider yourself to be an entrepreneur?" In posing the question, the NLSY79 defines an entrepreneur as “someone who launches a business enterprise, usually with considerable initiative and risk.” To provide some information on the degree to which the individual is engaged in an innovative activity, we use **Applied for Patent**, which equals one if the respondent in 2010 answered, "yes" to the question, "Has anyone, including yourself, ever applied for a patent for work that you significantly contributed to?"

---

<sup>9</sup>While the Illicit Activity Index might proxy (inversely) for risk aversion, our analyses caution against this presumption and hence highlight the degree to which the Illicit Activity Index measures the aggressive, illicit activities of individuals as youths. After controlling for other traits, we find that there is not a strong association between the Illicit Activity Index (measured in 1980) and a risk aversion indicator that assesses how much a person would sell an item with an expected, though risky, future value of \$5,000 (measured in 2006).



## IV.b The Earnings and Characteristics of Individuals by Employment Types

Panels A-C of Table 4 show that the summary statistics from the NLSY79 about age, race, gender, education, and labor market outcomes are similar to those from the CPS.<sup>10</sup> First, the median earnings of salaried workers are greater than those of the self-employed. Second, this conceals enormous differences between the incorporated and unincorporated self-employed. The median incorporated self-employed individual earns 41 percent more per hour and works 27 percent more hours than the median salaried worker. While the median unincorporated self-employed works about the same as a typical salaried worker, his or her earnings per hour are about 21 percent less than those of the median salaried worker. Third, the incorporated self-employed tend to be disproportionately white, male, and highly educated, while the unincorporated tend to be even less educated than salaried workers. The incorporated are notably different from the unincorporated self-employed.

Individuals who become incorporated self-employed tend to display strikingly distinct cognitive, noncognitive, and family characteristics along four key dimensions *before* they enter the labor market (Panel D of Table 4). First, in terms of family background, the incorporated self-employed come from comparatively (1) high-income families as measured by family income in 1979, (2) well-educated families as measured by the education of the individual's parents, and (3) "stable" families as measured by whether the individual lived in a two parent family at the age of 14. Second, people that become incorporated self-employed had (1) higher "ability" as measured by large AFQT values, (2) stronger self-esteem as measured by the high Rosenberg scores, and (3) a stronger sense that they control their futures, rather than having their futures determined by fate or luck, as measured by low Rotter Locus of Control scores. Third, on career ambitions, individuals that later become incorporated self-employed were almost twice as likely as others to have indicated that they wanted to be managers or proprietors *before* they entered the labor market. Fourth, people that spend more of their prime age working years as incorporated self-employed engaged in *more* illicit activities as youths. For example, the incorporated self-employed are twice as likely as salaried workers to report having taken something by force as youths; they are 44 percent more likely to have been stopped by the police; and, the incorporated self-employed have an overall illicit activity index, which is measured when they were between the ages of 15 and 22, that is almost three times greater than the index for salaried workers. All of these differences are statistically significant when using simple cross group t-tests.

In terms of these *ex ante* characteristics, it is perhaps unsurprising that entrepreneurship

---

<sup>10</sup>Since the basic unit of analysis is an individual-year observation and some people work in different employment types during their careers, we weight by the number of years the person worked in each type when providing summary statistics about fixed characteristics by employment type.

is associated with high cognitive aptitude, exceptional confidence in one’s abilities, and aspirations to be leaders, but it is perhaps more surprising entrepreneurs tend to engage in more illicit activities as youths than those that never become incorporated self-employed. As noted by Steve Wozniak, the co-founder of Apple, who hacked telephone systems early in his career, "... I think that misbehavior is very strongly correlated with and responsible for creative thought." (Kushner, 2012)

Furthermore, *after* working for a couple of decades, the incorporated self-employed are more likely to describe themselves as “entrepreneurs” and more likely to have contributed to a patent. Panel E of Table 4 shows that 65% of the incorporated self-employed define themselves as entrepreneurs (Entrepreneur) in 2012, i.e., as somebody who “launches a business enterprise, usually with considerable risk and initiative.” But, only 44% of the unincorporated and 17% of salaried workers categorized themselves as entrepreneurs. And, the incorporated self-employed are more than twice as likely as other people to have contributed work toward a patent application (Applied for Patent). We sharpen these analyses by first conditioning out those parts of Entrepreneur and Applied for Patent that are explained by education, gender, race, and year of birth. We then standardized the residuals for this regression to obtain Entrepreneur Residuals (standardized) and Applied for Patent Residuals (standardized). Using these standardized residuals, Table 4 shows that the incorporated are more likely to classify themselves as entrepreneurs - and much more likely to have contributed work to a patent - than other self-employed individuals. These findings are consistent with our strategy of using the incorporated self-employed as a better proxy for those engaged in entrepreneurial activities than using the aggregate group of self-employed.

#### **IV.c Selection on Observable Cognitive and Noncognitive Traits**

We now use multinomial logit regressions to isolate which pre-labor market traits have an independent association with employment choices. Table 5 provides regressions of employment type on gender, race, a dummy variable, HIGH AFQT, which equals one if the person’s AFQT score is above the mean and zero otherwise, the Rotter locus of control indicator, the Rosenberg self-esteem measure, and a dummy variable, High Illicit, which equals one if the person’s index of Illicit activities is above the sample mean and zero otherwise. We also include a dummy variable, (HIGH AFQT)\*(High Illicit), that is the interaction between the AFQT and Illicit dummy variables, so that (HIGH AFQT)\*(High Illicit) equals one if the individual both has AFQT and Illicit above the sample means. If we use the continuous versions of AFQT, Illicit, and their interaction, however, we obtain the same conclusions reported below. We control for the education of the person’s mother and father, family income in 1979, and whether both parents were living with the individual at the age of

14. The regressions also control for year of birth, year of the survey, and a quartic in potential experience. All of the even numbered equations further control for the educational attainment of the individual. In columns (1) and (2), the logit assesses the probability of self-employment versus salaried; in columns (3) and (4), the comparison is between unincorporated self-employment and salaried; and in columns (5) and (6), the regression provides estimates of the impact of each trait on the probability that the person is incorporated relative to being a salaried worker. By examining person-year observations, each person’s “employment type” is defined by the number of years spent in each employment type.

Several points emerge from the multinomial logit regressions. First, white men, people with high self-esteem, individual’s with a strong sense of controlling one’s future (i.e., a low Rotter locus of control score), and people with well-educated mothers are much more likely to be incorporated self-employed than others. The economic magnitudes are large. For example, holding other things constant, women are 76% less likely to incorporate than corresponding males.

Second, family income is a powerful predictor of entrepreneurship. The coefficient estimates indicate that a \$100,000 increase in family income - which is enough to boost somebody from the 10th to the 90th percentile - is associated with an almost 60% increase in the probability of incorporation, after controlling for the person’s cognitive and noncognitive traits, the person’s educational attainment, and other characteristics of the person’s family environment. To the extent that one views family income as a proxy for credit constraints after controlling for all of these factors, these results indicate that difficulties in obtaining finance materially influence entrepreneurial activity.<sup>11</sup>

Third, people that have both above average AFQT and above average Illicit Activity Index values have an almost 60% greater probability of becoming incorporated than other people after controlling for many characteristics. Furthermore, Table 5 shows that the combination of “smart” and “illicit” traits only boosts the probability of becoming incorporated self-employed. The mixture of high learning aptitude and “break-the-rules” behavior is tightly linked with entrepreneurship.

#### **IV.d Selection on Labor market Ability**

The NLSY79 data provide a unique opportunity to quantify the role of sorting on typically unobserved labor market skills. Almost all people - about 90% in our sample of full-time, full-year working adults - are salaried workers at some point in their careers, so we observe almost all people in a common employment type. Thus, we can study the linkages between

---

<sup>11</sup>Blanchflower and Oswald (1998) find that the probability of self-employment is positively related to whether the individual ever received an inheritance.

comparative success as a salaried worker and sorting into incorporated and unincorporated self-employment. To do this, we condition out differences in wages due to age, industry, occupation, and year effects and compute "Adjusted Hourly Wage".<sup>12</sup> We then run a new battery of multinomial logit regressions to assess whether ability as a salaried worker - as measured by Adjusted Hourly Wage - explains sorting into employment types and report the results in Table 6. We control for the educational attainment of each individual along with all of the regressors included in Table 5. We do not, however, report all of the coefficient estimates for brevity. Moreover, and critically, regressions (2), (4), and (6) include the interaction between Adjusted Hourly Wage and the Illicit Activity Index to assess whether the mixture of these characteristics - success as a salaried worker and a high propensity to engage in illicit activities as a youth - shapes employment decisions. To focus on a more homogeneous group of individuals, we only examine full-time, full year white males for the remainder of our analyses.

The Table 6 results indicate positive sorting into incorporated self-employment and negative sorting into unincorporated self-employment on residual hourly salaried earnings. We believe this is the first paper to show that successful salaried workers are more likely to become entrepreneurs, while unsuccessful salaried workers are more likely to become unincorporated self-employed.

This sorting into incorporated self-employment is driven by a very particular subset of high residual earning individuals. As shown by the interaction term, individuals who are both comparatively successful salaried workers *and* who were highly engaged in illicit activities in their youths have a higher propensity to become incorporated self-employed. Apparently, it is a combination of comparatively strong labor market skills and a tendency to bend, if not break, the rules that influences who becomes an entrepreneur.<sup>13</sup>

#### **IV.e Transitions Across Employment Types with NLSY79 Sample**

Consistent with the CPS analyses, the NLSY79 transition matrices presented in Table 7 indicate that (a) only a few people switch from unincorporated to incorporated self-employment, (b) it is the comparatively highly paid individuals that transit into incorporated

---

<sup>12</sup>The findings reported in Table 5 on Adjusted Hourly Wage are robust to using either actual hourly wage or the residual hourly wage from a full Mincerian wage regression.

<sup>13</sup>Note, in Table 6, family income no longer enters significantly, as it did in Table 5. The change in significance does not reflect the additional regressor, Adjusted Hourly Wage. Rather, the drop in significance of the estimated coefficient on family income reflects the change in sample, as Table 6 only includes full-time, full-year white males. We find that family income is especially important in accounting for entrepreneurship among women and minorities. This is consistent with the view that women and minorities face additional barriers to entrepreneurship, such that the marginal impact of family income on the discrete decision to become incorporated self-employed is much larger for women and minorities.

self-employment from other employment types, (c) it is the comparatively unsuccessful incorporated self-employed who transit back into salaried employment rather than remaining incorporated, and (d) it is the comparatively low paid individuals that transit into unincorporated self-employment. Since the NLSY shifted to surveying people every other year over the later part of the survey, we compute the transitions using this two-year structure throughout. Specifically, about 0.74 percent of white, prime age males shift from salaried to incorporated each year, while only 0.22 percent of white, prime age males shift from unincorporated to incorporated self-employment.<sup>14</sup> There is not much switching between incorporated and unincorporated self-employment, as illustrated by Figures 1a and 1b. When individuals leave either self-employment type, they tend to transit into salaried work. Omitting the few individuals who transit between self-employment types does not alter the results reported below.

These matrices show the positive sorting into incorporated self-employment on earnings: the residual earnings of salaried workers that become incorporated are on average 17 percent greater than those of salaried workers that remain employees. Also, Panel B indicates that the unsuccessful incorporated (mean hourly earnings of 23.5) tend to return to salaried employment, while those that stay incorporated had mean hourly earnings of 31. The negative sorting into unincorporated self-employment is also clear. The residual earnings of salaried workers who switch into unincorporated self-employment are 18 percent less than those of salaried workers who do not switch.

Consistent with the multinomial logit analyses, the Table 7 transition matrices illustrate the positive sorting into incorporated self-employment - and the negative sorting into unincorporated self-employment - on learning aptitude and self-esteem. It is the higher AFQT individuals (60.5) that on average switch from salaried into incorporated self-employment, and the lower AFQT individuals (53.3) that move into unincorporated self-employment.<sup>15</sup> Sorting on self-esteem is even more pronounced. Workers that move from salaried to incorporated self-employment have self-esteem scores (0.24) that are twice those of salaried workers who remain salaried (0.11). And, salaried workers who move into unincorporated self-employment have self-esteem scores (0.04) that are less than half of those salaried work-

---

<sup>14</sup>To get this, note that 92% of white, prime age workers are salaried and 0.8% of these individuals transit into incorporated self-employment (Table 7). Thus, on average, about 0.74% ( $92\% \times 0.8\%$ ) of white, prime age workers shift from salaried to incorporated each year. Similarly, about 7% of white, prime age workers are unincorporated and 3.1% of these transit into incorporated self-employment (Table 7). Thus, on average, about 0.22% ( $7\% \times 3.1\%$ ) shift from unincorporated self-employment to incorporated self-employment each year.

<sup>15</sup>It is also the high AFQT people that switch from incorporated self-employment into salaried work. Since people rarely start their work careers as incorporated, this reflects the nature of the people who ever incorporate.

ers remaining salaried employees. Switching into and out of different employment types is by no means random. These findings are consistent with the work of Horvath and Zuckerman (1993), Zukerman (1994), and Nicolaou, Shane, Cherkas, and Spector (2008), who argue that personality traits influence sorting into entrepreneurship.

## V Mincerian Returns to Entrepreneurship

### V.a Residual Hourly Earnings with Individual Effects

Given the selection forces noted so far, we now assess whether an individual, on average and at the median, earns more when he becomes incorporated self-employed. In Panel A of Table 8, we distinguish between salaried and the self-employed. Panel B further disaggregates between the incorporated and unincorporated. We examine both hourly earnings and the change in hourly earnings. We use person fixed effects in the OLS regressions and deviations from each person's median earnings in the median regressions to account for person time invariant effects. All the level specifications control for schooling (six categories), potential experience (quartic), measures of cognitive and noncognitive traits (AFQT, Rosenberg Self-Esteem, Rotter Locus of Control, and Illicit Activity Index), as well as year, industry, and occupation fixed effects. The first difference specifications control for the time-varying components of these control variables. The sample includes white, male workers who are at least 25 years old.

Table 8 stresses three interrelated findings. First, individuals who become incorporated self-employed at some point during their careers earn more as salaried workers than individuals with the same observable traits who never incorporate. To see this, consider regressions (11) and (12). Regression (11) indicates that the average residual earnings of the incorporated are about 48.2 percent greater than salaried workers. Regression (12) indicates that the average residual earnings of an individual are 18.1 percent higher when he is incorporated. The difference between these two estimates indicates that the average person - who at some point in his career is incorporated - enjoys residual earnings of about 30.1 (=48.2 - 18.1) percent more as a salaried worker than a salaried worker with the same observable traits, including industry and occupation, who never incorporates.

Second, when an individual becomes incorporated, his residual hourly earnings tend to rise markedly. On average, residual earnings are 18.1 percent higher after a person becomes incorporated than when he was salaried. Evaluated at the median (regression 18), the difference is 6.4 percent. Moreover, we find essentially the same coefficient estimates when examining *changes* in residual hourly earnings: When a person becomes incorporated self-employed residual earnings jump.

Third, the pattern is essentially reversed for the unincorporated self-employed. A person's average hourly residual earnings are almost 3 percent lower when he is an unincorporated self-employed businessman than when he is a salaried worker.

The results presented in Table 8 indicate that people tend to earn more when they are incorporated self-employment than when they are salaried workers. Although, on average, people that at some point in their careers incorporate earn more as salaried workers than their salaried counterparts who never incorporate, those that incorporate earn still more once they incorporate. The results do not suggest incorporation causes an increase in earnings. Rather, and contrary to a large literature, the results suggest that when a person chooses to incorporate, he tends to experience a substantive increase in residual hourly earnings.

Table 8 also addresses the possibility that individual-specific trends drive the findings: perhaps, people with a steeper earnings profile have a higher propensity to incorporate, but incorporation is not associated with a change in the slope of this trend. One possible explanation for trend differences is "on the job training." Some individuals might receive low wages when they are young employees as a means of "paying" for the accumulation of non-firm-specific human capital, which is then expected to yield positive returns in the form of greater future earnings. If the propensity to incorporate is strongly associated with receiving a comparatively large boost in human capital from such "on the job training," then incorporation will be associated with an especially large boost in earnings as individuals realize the returns from the earlier accumulation of human capital. From this perspective, the jump in earnings that accompanies a switch from salaried work to incorporated self-employment reflects the realization of "on the job training," not the returns to entrepreneurship. Simply controlling for individual effects will not address this concern.

Consequently, we examine whether there is a break in an individual's earnings profile associated with a switch into, or out of, incorporated self-employment by examining the relationship between changes in earnings and changes in employment type while controlling for person specific effects. Thus, the dependent variable in regressions 3-6, 9-10, 13-16, and 19-20 of Table 8 is the change in earnings over two or four years as indicated. In the change in earnings regressions when using a two-year change, Incorporated equals: one if the person is incorporated this year but was not incorporated two years ago; negative one if the person is not incorporated this year but was incorporated two years ago; and zero if the person did not change into or out of incorporated self-employment from two years ago to this year. Unincorporated in these change in earnings regressions is defined analogously. Furthermore, we provide the OLS change in earnings regressions with individual fixed effects to control for individual-specific trends in earnings.

As shown, there is a positive break in an individual's earning profile associated with

switching from salaried work into incorporated self-employment. Note, the coefficient estimates from the change regressions, where the dependent variable is the change in earnings and the coefficient of interest is the change in employment type, are very similar to the coefficient estimates from the level regressions, where the dependent variable is earnings and the coefficient of interest is employment type. These results indicate that after controlling for individual trends in earnings, there is a significant boost in earnings associated with becoming an entrepreneur.

## V.b Robustness Tests

These results are robust to several concerns. First, we were concerned that something odd could be happening during the year of incorporation. Thus, we omitted the two years before and the two years after incorporation and confirm that earnings rose after individuals incorporated.

Second, we were concerned that individuals buying into businesses in which they were working as salaried workers, rather than starting their own business, were driving the results. This is not the case. Virtually all of the switches into incorporation involve a change of firms. When we limit incorporation to situations in which a person changes firms, we get virtually identical results.

Third, we were concerned that earnings growth might predict changes in employment type. Consequently, we examined the relationship between the change in hourly earnings between period  $t-2$  and  $t-4$  and the change in employment type from period  $t$  to  $t-2$ . If the change in earnings is associated only with a contemporaneous change in employment type, then we expect this regression to yield an insignificant coefficient. If, however, increases in earnings tend to precede transitions into incorporated, then we would expect to find a positive coefficient. There is not a statistically significant relationship between a change in earnings and subsequent shifts into incorporated self-employment. While earlier results document the positive sorting into entrepreneurship on earnings, the evidence does not indicate that jumps in earnings are good predictors of subsequent shifts into incorporation; rather, earnings jump when people switch into incorporated self-employment.

Fourth, we were concerned that sorting on time-varying factors could drive the results. Perhaps, an “Ashenfelter dip” in salaried earnings induces some individuals to switch into self-employment, yielding a positive association between shifts out of salaried employment and earnings. Two extensions of the analyses, however, suggest that such potential transitory shifts are not driving the results. First, we find that the results hold when examining the relationship between the change in residual earnings and changes in employment type over six-year horizons. That is, we extend the analyses in Table 8 out to six years and



confirm the results. Indeed, the estimated change in residual earnings does not fall as we move to longer horizons, which is inconsistent with an “Ashenfelter dip” explanation of the fixed effect findings. Second, we use instrumental variables to provide some evidence about the possibility that temporary drops in salaried earnings drive the movement of workers into incorporated self-employment and hence the finding that residual earnings rise when people incorporate. Thus, we use lagged values of employment type as instruments for current employment type. These instruments are valid under the assumption that the autocorrelation in earnings dies out faster than the autocorrelation in employment type, which is likely to be the case if there are some fixed costs associated with changing employment types. By using these instruments, we examine the relationship between residual earnings and projected employment type, where the projection is based on the longer-run determinants of employment type and hence abstracts from temporary factors that lead to changes in employment type. As shown in Table 9, the two-stage least square results yield virtually identical coefficient estimates to the OLS estimates, suggesting that transitory changes in earnings are not driving the results.

Fifth, we were concerned that people who receive a persistent positive increase in productivity will tend to incorporate, generating a spurious relationship between incorporation and earnings. Consequently, in Table 10, we include two additional dummy variables: Incorporated Past equals one in the year that a person becomes incorporated and remains one for the rest of his life; and Unincorporated Past equals one in the year that a person becomes unincorporated and remains one for the rest of his life. We continue to find an increase in earnings - of similar magnitude to our earlier estimates - when individuals switch into incorporated self-employment even when controlling for whether they have been incorporated in the past. The change in earnings is associated with a change in employment type *per se*.

The results presented in Table 10 also indicate that individuals that try entrepreneurship and then return to salaried jobs do no worse in these salaried jobs than they were doing before initiating the incorporated business. From regressions (4) and (8), an individual’s average and median residual hourly earnings as a salaried worker do not fall after trying an entrepreneurial endeavor.

## **VI Differential Returns to Traits, the Distribution of Earnings, and Hours Worked**

Having shown that individuals that incorporate experience a material increase in earnings relative to their past earnings and their projected trend earnings and having demonstrated the positive sorting into entrepreneurship on the combination of ability (as measured by

AFQT or residual hourly earnings as a salaried worker) and “a break-the-rules” behavioral trait (as measured by high values of Illicit Activities Index as a teenager), we now explore three key questions. First, do the same traits associated with selection into entrepreneurship also account for the differential earnings of entrepreneurs, suggesting a link between expected returns to entrepreneurship and the tendency to become an entrepreneur? Second, how does the distribution of earnings associated with entrepreneurship differ from the distribution of salaried earnings? Third, do the incorporated and unincorporated self-employed work more or less than salaried workers?

## **VI.a Differential Returns to Traits by Employment Types**

Although this paper focuses on the sorting of individuals with particular constellations of traits into different employment types and the relative earnings associated with those employment types, we can also shed empirical light on the degree to which different traits are associated with differential changes in earnings when people switch employment types. This provides information on two questions. First, do the same traits that explain the sorting of individuals into incorporated self-employment also explain the differential earnings of the incorporated self-employed? Second, do the same skills account for earnings differences across different employment types?

Table 11 provides estimates of the change in earnings associated with changes of employment type, while splitting the sample based on traits that we found to be important in accounting for the self-sorting of individuals into different employment types. As a measure of skills as a salaried worker, we classify a person as “High Wage” if he has above the average earnings as a salaried worker and categorize the person as “Low Wage” if he has below average wages when working as a salaried employee. To compute High and Low Wage, we again use Adjusted Hourly Wage, which conditions out potential work experience, age, and fixed effects for year, occupations, and industries. We categorize people according to the degree to which they engaged in illicit activities as teenagers, again splitting the sample at the average between High and Low Illicit individuals. For brevity, we simply present median regressions. OLS analyses yield the same conclusions.

Cognitive and non-cognitive traits matter in accounting for changes in earnings associated with changes in employment types. The results presented in Table 11 indicate that the positive association between a change in earnings and a switch into incorporated self-employment exists especially for highly skilled workers (as measured by High Salaried Wage), who exhibit a greater tendency to break the rules (as measured by High Illicit). Indeed, individuals with low labor market skills and a low level of the Illicit Activity Index tend to suffer reductions in earnings when they incorporate. The results in Table 11 and the earlier results in Tables

5 and 6 indicate that some of the same traits that induce people to become incorporated self-employed - those traits that lead to success as salaried workers in conjunction with illicit behavior as a youth - also explain comparative earnings as an entrepreneur. These findings are consistent with the views that (a) expected higher earnings attract people with particular traits into entrepreneurship and (b) the combination of traits associated with high earnings in incorporated self-employment are not comparably associated with large earnings when employed in other employment types.

These findings contribute to existing research on the characteristics of successful entrepreneurs. Research indicates that self-esteem, optimism, and a taste for novelty are associated with a propensity for individuals to try self-employment (Horvath and Zuckerman 1993; Zukerman 1994; Nicolaou, Shane, Cherkas, and Spector 2008). Lazear (2004, 2005) stresses that entrepreneurs must be “jacks-of-all-trades” to coordinate factor inputs successfully.<sup>16</sup> Our work demonstrates that a special mixture of cognitive and noncognitive skills - the combination of outstanding abilities as a salaried worker and break-the-rules tendencies - is strongly associated with entrepreneurial success.

## **VI.b Distribution of Hourly Earnings by Employment Types, NLSY79**

Since entrepreneurship involves the undertaking of risky, innovative activities, the earnings distribution facing entrepreneurs might differ markedly from the distribution facing others. While earlier results indicate an increase in the median residual hourly earnings of individuals that switch from salaried to incorporated self-employment, the median is only one point in the earnings distribution and therefore provides an incomplete picture of comparative earnings profiles.

Figure 2a and 2b plot the comparative residual hourly earnings for the incorporated and unincorporated respectively relative to salaried workers at each decile of the hourly earnings distribution.<sup>17</sup> Thus, for example, we compare the residual hourly earnings of the incorporated self-employed at the 70th-percentile of the hourly earnings distribution of the incorporated with the residual hourly earnings of a salaried worker at the 70th-percentil of the hourly earnings distribution of salaried workers. For each decile, the figures report three bars: (i) residual hourly earnings, (ii) deviations of residual hourly earnings from a persons’ median hourly residual earnings and the (iii) change in residual hourly earnings over the past four years, where residual earnings are obtained from a wage regression that controls for education (six categories), potential experience (quartic), AFQT, Rosenberg self-esteem,

---

<sup>16</sup>However, aggregating together all of the self-employed, Hartog, Praag, and Sluis (2010) do not find differences in the traits of the self-employed relative to salaried workers.

<sup>17</sup>We examine full-time, full-year, prime age whites, though the results are similar for broader samples.

Rotter Locus of Control, and the Illicit Activity Index.

Figures 2a and 2b illustrate that (a) the earnings distributions of the self-employed - especially the incorporate self-employed - have much fatter tails than those of salaried workers, and (b) these fatter tails reflect factors beyond person-specific earnings. For example, a person that is exceptionally successful when incorporated (90th-percentile of the residual hourly earnings distribution of the incorporated self-employed) tends to enjoy a 30 percent boost in hourly earnings relative to his own hourly earnings as an exceptionally successful salaried worker (90th-percentile of the residual hourly earnings distribution of salaried workers). And, a person that is exceptionally unsuccessful when he incorporates (10th-percentile of the residual hourly earnings distribution of the incorporated) tends to suffer a 10 percent drop in hourly earnings relative to his own hourly earnings as an exceptionally unsuccessful salaried employee (10th-percentile of the residual hourly earnings distribution of salaried workers).<sup>18</sup> Figure 2a is consistent with the view that entrepreneurship, at the median, pays - and it offers the possibility of comparably enormous returns.

These results suggest the possibility of a large option value associated with entrepreneurship: there are potentially enormous gains from undertaking an entrepreneurial activity and individuals can return to salaried employment if their entrepreneurial endeavors do not succeed. With respect to the potential upside associated with incorporation, Figure 2a illustrates this point. With respect to returning to salaried employment, we find (see below in Table 10) that the incorporated self-employed that transit back to salaried employment return at essentially their old salaried wage. We do not find evidence of a “salaried earnings penalty” from becoming an entrepreneur.

## VI.c Hours Worked

Given the literature’s emphasis on the autonomy and flexibility of self-employment (Hamilton, 2000; Hurst and Pugsley, 2011) and the possibility that the self-employed choose to work fewer hours and hence move along their marginal product curves to higher hourly earnings, we examine the association between hours worked and employment type. In Table 12, the dependent variable is annual hours worked. The regressions include the indicators of employment type, education (six categories), potential experience (quartic), AFQT, Rosenberg self-esteem, Rotter Locus of Control, and the Illicit Activity Index, along with year, industry, and occupation fixed effects.

---

<sup>18</sup>The “fat tails” of the hourly earnings distribution for the unincorporated self-employed are less pronounced than those of the incorporated self-employed, but still noticeable. While the earnings profile of the incorporated self-employed is skewed to the right, the profile of the unincorporated self-employed is highly skewed to the left.

The self-employed tend to work many more hours than salaried workers. When not including individual effects, the average incorporated self-employed works 340 hours more per year than a full-time, full-year comparable salaried worker (regression 3). When including individual effects, regression (4) indicates that average annual work hours increase by about 144 hours. These patterns also hold for unincorporated individuals, who also, on average, work more than they did as salaried employees. Self-employment involves a material jump in “effort,” as measured by hours worked.

## VII A Conceptual Framework for Interpreting these Empirical Findings

To characterize our empirical results within a conceptual framework, we construct a stylized model of the sorting of individuals into salaried, incorporated and unincorporated self-employment and the comparative earnings associated with this sorting. Based on the two-sector Roy (1951) model, we build a three-sector model to illustrate why people with different mixtures of cognitive and noncognitive traits sort into the three different employment types and to understand the resultant distribution of earnings.<sup>19</sup>

Let an individual  $i$  choose whether to work as a salaried worker ( $S_i = 1$ ) and earn  $W_{S,i}$  or to establish an incorporated ( $I_i = 1$ ) or unincorporated business ( $U_i = 1$ ), with earnings  $W_{I,i}$  and  $W_{U,i}$  respectively. Gross earnings are given by a constant-returns-to scale function of effective human capital ( $H$ ) and labor ( $L$ ), where the value (“prices”) of labor and human capital differ across the employment types, reflecting the intensity of these inputs in the three activities:

$$W_{J,i} = (1 - \tau_J) H_{J,i}^{\eta_J} L_i^{(1-\eta_J)} \quad J = (S, I, U), \quad (1)$$

where  $\tau_J$  measures the implicit “tax rate” imposed by tax and regulatory authorities. Consistent with the nature of these taxes, fees, and costs discussed in Section II, we assume that (1) these taxes are proportional to gross earnings and (2) the incorporated are subject to the highest “tax rate”. We also assume that the unincorporated are subject to the lowest taxes, fees, and costs, since the work by Hamilton (2000) and others suggests that the unincorporated self-employed can more effectively reduce their effective tax rates than salaried workers by under-reporting income and are subject to fewer and lower formal taxes, fees, and other costs than the incorporated. For simplicity of notation but without loss of generality, we

---

<sup>19</sup>Researchers have used the standard two-sector Roy (1951) model to examine an array of issues, including women’s wages (Gronau, 1974; Heckman, 1974; Mulligan and Rubinstein 2008), schooling (Willis and Rosen, 1979) and immigration (Borjas, 1987).

scale these taxes so that  $\tau_S = 0$ , so that  $\tau_I > 0 > \tau_U$ . Consistent with the empirical findings presented above, we assume that incorporated self-employment is a comparatively human capital intensive activity and that unincorporated self-employment is a comparatively labor intense activity, so that  $\eta_I > \eta_S > \eta_U$ . Finally, note that we allow the effectiveness of an individual's human capital to differ across employment types ( $H_{J,i}$ ) since the productivity of a person's particular mixture of traits might differ in different activities.

As we discovered in the empirical analyses, cognitive ( $C_i$ ) and noncognitive ( $N_i$ ) traits are not equally productive in the three employment types. For instance, the mixture of "smart" and "illicit" tendencies yields high returns in entrepreneurial activities, but not in salaried work. Thus the same mixture of traits yields different levels of effective human capital in different employment types. Using Griliches's (1977) human capital production function approach, the mixture of cognitive and noncognitive traits yields effective levels of human capital as follows:

$$H_{J,i}(C_i, N_i) = \exp(\beta_J C_i + \gamma_J N_i), \quad (2)$$

where the  $\beta$ 's and especially the  $\gamma$ 's might vary qualitatively across employment types.

We can now represent the earnings of the incorporated and unincorporated self-employed as functions of salaried earnings. To do this, take the natural logarithm of equations (1) and (2) and rearrange the terms to obtain the following:

$$\begin{aligned} w_{I,i} &= a_I + p_I w_{S,i} + \varepsilon_{I,i}, \\ w_{U,i} &= a_U + p_U w_{S,i} + \varepsilon_{U,i}, \end{aligned} \quad (3)$$

where  $a_J = \ln(1 - \tau_J)$ ,  $p_J = 1 + \Delta\eta_J/\eta_S$ ,  $w_{S,i} = \eta_S h_{S,i}$ ,  $\varepsilon_{J,i} = \eta_J \Delta h_{J,i}$ , and where  $\Delta h_{J,i} = h_{J,i} - h_{S,i}$  and  $\Delta\eta_J = \eta_J - \eta_S$ .<sup>20</sup>

Relative to salaried employment, the  $\varepsilon_I$ 's and the  $\varepsilon_U$ 's reflect the comparative advantages of a person's cognitive and noncognitive traits in incorporated and unincorporated self-employment respectively. It is worth noticing that in the case where the production function of human capital does not vary across employment types - that is, in the case where  $\beta$  and  $\gamma$  are the same for all  $J$ , then the  $\varepsilon_I$ 's and the  $\varepsilon_U$ 's equal to zero and the model is reduced,

---

<sup>20</sup>To get this, take the natural log of (1), let  $L$  equal 1 for all  $i$ , and use lower case letters to signify the natural log:  $w_{I,i} = \ln(1 - \tau_I) + \eta_S h_{S,i} + [\eta_I h_{I,i} - \eta_S h_{S,i}]$ . Some manipulation yields:  $w_{I,i} = \ln(1 - \tau_I) + \eta_S h_{S,i} + [(\eta_S + \Delta\eta_I)(h_{S,i} + \Delta h_{I,i}) - \eta_S h_{S,i}]$ , where  $\Delta h_{J,i} = h_{J,i} - h_{S,i}$  and  $\Delta\eta_J = \eta_J - \eta_S$ . Then:  $w_{I,i} = \ln(1 - \tau_I) + \eta_S h_{S,i} + [\Delta\eta_I h_{S,i} + \eta_S \Delta h_{I,i} + \Delta\eta_I \Delta h_{I,i}]$ , and:  $w_{I,i} = \ln(1 - \tau_I) + (\eta_S + \Delta\eta_I) h_{S,i} + [\eta_S \Delta h_{I,i} + \Delta\eta_I \Delta h_{I,i}]$ . Finally, let  $a_J = \ln(1 - \tau_J)$ ,  $p_J = 1 + \Delta\eta_J/\eta_S$ ,  $w_{S,i} = \eta_S h_{S,i}$ ,  $\varepsilon_{J,i} = \eta_J \Delta h_{J,i}$ , and where  $\Delta h_{J,i} = h_{J,i} - h_{S,i}$  and  $\Delta\eta_J = \eta_J - \eta_S$ , so that  $w_{I,i} = a_I + p_I w_{S,i} + \varepsilon_{I,i}$ .

implicitly, to a one skill model, such that the most productive salaried workers are also the most productive incorporated and unincorporated self-employed business owners.

Assuming that workers maximize lifetime earnings, they sort into the different employment types using the following rules:

$$\begin{aligned}
 U_i &= 1 \left( w_{S,i} < \frac{a_U + \varepsilon_{U,i}}{1 - p_U} \right), \\
 S_i &= 1 \left( \frac{a_U + \varepsilon_{U,i}}{1 - p_U} \leq w_{S,i} \leq \frac{a_I + \varepsilon_{I,i}}{1 - p_I} \right), \\
 I_i &= 1 \left( w_{S,i} > \frac{a_I + \varepsilon_{I,i}}{1 - p_I} \right).
 \end{aligned} \tag{4}$$

Figure 3 illustrates the sorting into the three employment types when  $\varepsilon_{U,i} = \varepsilon_{I,i} = 0$ . In this setting, incorporated self-employment attracts the *most* productive salaried workers and unincorporated self-employment attracts the *least* productive salaried workers, as documented empirically in Table 6. The median incorporated makes much more than the median salaried worker. Yet, as found empirically in Table 8, much of that difference reflects the gap in skills rather than the gap of employing those skills in different employment types. The median unincorporated self-employed earns less than the median salaried worker. Again, this gap primarily reflects the gap in skills, rather than the negative impact employing the worker's particular constellation of skills in unincorporated self-employment. Figure 3 also illustrates why combining the incorporated and the unincorporated into an aggregate category is meaningless and misleading, as documented throughout the empirical analyses above.

This analytical framework also captures a key empirical finding from Tables 5, 6, and 11 above: not all cognitive and noncognitive traits are equally valued in different employment types; that is, the framework illustrates the non-trivial sorting on cognitive and noncognitive traits by allowing the  $\varepsilon$ 's to differ across individuals. For example, an individual with the comparatively aggressive, risk-taking traits associated with high values of the Illicit Index will tend to have a positive  $\varepsilon_I$ . This will involve a parallel shift up in the person's  $w_{I,i}$  curve, increasing the likelihood that the person will find incorporated self-employment a higher earning employment type than salaried or unincorporated self-employment.

Thus, this simple, transparent model frames our empirical findings on who becomes an entrepreneur and the differential earnings associated individual with different cognitive and noncognitive traits self-sorting into different employment types. Although this paper's major contributions are empirical, the model provides a conceptual basis both for understanding the differences between our findings and the large literature examining the returns to entre-

preneurship that uses self-employment as a proxy for entrepreneurship and for understanding why people with different mixtures of cognitive and noncognitive traits sort into different employment activities.

## VIII Conclusions

Research raises puzzling questions about entrepreneurs and entrepreneurship. Although profit-motivated, risk-taking entrepreneurs play leading roles in theories of technological innovation and economic growth, researchers find that the median self-employed person earns less than his salaried counterpart, while having comparable cognitive and noncognitive traits. Do entrepreneurs really have the same traits as salaried employees and earn less money?

Dividing the self-employed into the incorporated and unincorporated resolves these puzzles and yields the following insights into entrepreneurs and entrepreneurship. First, the incorporated self-employed earn much more per hour, and work many more hours, than their salaried and unincorporated counterparts, and the unincorporated earn much less per hour than comparable salaried workers. This helps account for the earlier puzzle: the incorporated earn more than salaried workers, the unincorporated earn less, and there are more unincorporated than incorporated self-employed. Individual effects do not fully account for these results. While some people have traits that cause them both to earn more regardless of employment type and to incorporate more frequently, they earn still more when opening incorporated businesses. After conducting and presenting an array of robustness tests, we find as a lower-bound estimate that on average (at the median) a person who chooses to become incorporated self-employed earns about 18% (6%) more than he was earning as a salaried employee. In this sense, entrepreneurship pays.

Second, the incorporated have a very distinct mixture of cognitive, non-cognitive, and family traits that differs from those of unincorporated and salaried workers. The incorporated tend to be better-educated and more likely to come from high-earning, two-parent families. Furthermore, as teenagers, the incorporated tend to have higher learning aptitude and self-esteem scores and engage in more aggressive/risky behaviors than salaried employees. But, apparently it takes more to be a successful entrepreneur than having these strong labor market skills: the incorporated self-employed also tend to engage in more illicit activities as youths than other people who succeed as salaried workers. It is a particular *mixture* of traits that seems to matter for both becoming an entrepreneur and succeeding as an entrepreneur. It is the high ability (as measured by learning aptitude and success as a salaried worker) person who tends to “break-the-rules” (as measured by the degree to which



the person engaged in illicit activities before the age of 22) who is especially likely to become a successful entrepreneur. For many characteristics, the unincorporated tend to be on the other side of the distribution from salaried employees. These findings help explain the earlier puzzle about the similarity of traits between salaried and self-employed individuals: the traits of the average salaried worker tend to fall between those of the average incorporated and unincorporated person.

Third, incorporated self-employment offers a higher probability of enormous returns to individuals with particular cognitive, noncognitive, and family traits. When the incorporated self-employed succeed, they tend to do much better than successful salaried workers. Moreover, when the incorporated succeed, it is the high cognitive ability, high self-esteem, and highly aggressive / risk-taking traits that account for this success to a much greater degree than they account for the success of salaried and unincorporated workers. These findings emphasize that there are differential returns to traits across employment types. Apparently, people sort into different employment activities based, at least partially, on the expected earnings from employing their particular constellation of characteristics in particular employment types.

## References

- [1] Aghion, Philippe, and Peter Howitt. 2009. *The Economics of Growth*. Cambridge, MA: MIT Press.
- [2] Alchian, Armen A., and Harold Demsetz. 1972. Production, information costs and economic organization. *American Economic Review* 62: 777-795.
- [3] Autor, David H., Frank Levy, and Richard J. Murnane. 2003. The skill content of recent Technological change: An empirical investigation. *Quarterly Journal of Economics* 118 (November 4): 1279-1333.
- [4] Baskin, Jonathon B., and Paul J. Miranti, Jr. 1997. *A History of Corporate Finance*. New York: Cambridge University Press.
- [5] Berle, Adolf A., and Gardiner C. Means. 1932. *The Modern Corporation and Private Property*. New York: Commerce Clearing House.
- [6] Bernardo, Antonio E., and Ivo Welch. 2001. On the evolution of overconfidence and entrepreneurs. *Journal of Economics & Management Strategy* 10 (3): 301-330.
- [7] Blanchflower, David G., and Andrew J. Oswald. 1998. What makes an entrepreneur? *Journal of Labor Economics* 16 (1): 26-60.
- [8] Blau, David M. 1985. A time-series analysis of self-employment in the United States. *Journal of Political Economy* 95 (June): 445-67.
- [9] Borjas, George J. 1987. Self-selection and the earnings of immigrants. *American Economic Review* 77 (44): 531-553.
- [10] Borjas, George J., Stephen G. Bronars. 1989. Consumer discrimination and self-employment. *Journal of Political Economy* 97 (June): 581-605.
- [11] Bowles, S., H. Gintis, and M. Osborne. 2001. The determinants of earnings: A behavioral approach. *Journal of Economic Literature* 39 (4): 1137-1176.
- [12] Braudel, Fernand. 1982. *Civilization and Capitalism: 15th-18th Century. Vol. 2: The Wheels of Commerce*. London: Collins.
- [13] Brealey, Richard A., Stewart C. Myers, and Franklin Allen. 2011. *Principles of Corporate Finance*. New York: McGraw-Hill.

- [14] Chandler, Alfred D., Jr. 1954. Patterns of American railroad finance, 1830-50. *The Business History Review* 28 (3): 248-263.
- [15] Chandler, Alfred D., Jr. 1965. The Railroads: Pioneers in modern corporate management. *The Business History Review* 39 (1): 16-40.
- [16] Chandler, Alfred D., Jr. 1977. *The Visible Hand: The Managerial Revolution in American Business*. Cambridge, MA: Harvard University Press.
- [17] Cooper, Arnold C., Carolyn Y. Woo, and William C. Dunkelberg. 1988. Entrepreneurs' Perceived changes for success. *Journal of Business Venturing* 3 (Spring): 97-108.
- [18] Dawson, Christopher, David de Meza, Andrew Henley, and G. Reza Arabsheibani. 2011. Entrepreneurship, cause or consequence of financial optimism. LSE mimeo.
- [19] De Meza, David, and C. Southey. 1996. The borrower's curse: Optimism, finance, and entrepreneurship. *Economic Journal* 106: 375-386.
- [20] Durlauf, Steven N., and Marcel Fafchamps. 2005. Social Capital. In: Philippe Aghion & Steven Durlauf (eds.), *Handbook of Economic Growth*, Vol. 1, Amsterdam: Elsevier: 1639-1699.
- [21] Elfenbein, Daniel W., Barton H. Hamilton, and Todd R. Zenger. 2010. The small firm effect and the entrepreneurial spawning of scientists and engineers. *Management Science* 56 (February): 659-681.
- [22] Evans, David S., and Boyan Jovanovic. 1989. An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy* 97 (4): 808-27.
- [23] Evans, David S., and Linda S. Leighton. 1989. Some empirical aspects of entrepreneurship. *American Economic Review* 79 (June): 519-35.
- [24] Fairlie, Robert W. 2005. Self-employment, entrepreneurship, and the NLSY79. *Monthly Labor Review* 128 (February): 40-47.
- [25] Fairlie, Robert W., and Bruce D. Meyer. 1996. Ethnic and racial self-employment differences and possible explanations. *Journal of Human Resources* 31 (Autumn): 757-793.
- [26] Fama, Eugene. 1980. Agency problems and the theory of the firm. *Journal of Political Economy* 8: 288-307.
- [27] Garicano, Luis, and Esteban Rossi-Hansberg. 2006. Organization and inequality in a knowledge economy. *Quarterly Journal of Economics* (November): 1383-1435.

- [28] Glaeser, Edward L. 2007. Entrepreneurship and the city. NBER Working Paper 13551.
- [29] Goetzmann, William N., Rouwenhorst, K. Geert. 2005. *The Origins of Value: The Financial Innovations that Created Modern Finance*. New York: Oxford University Press.
- [30] Gort, Michael, and Seong-Hoon Lee. 2007. The rewards to entrepreneurship. Working Paper, State University of New York, Buffalo.
- [31] Griliches, Zvi. 1977. Estimating the returns to schooling: Some econometric problems. *Econometrica* 45(1): 1-22.
- [32] Gronau, Reuben. 1974. Wage comparisons - a selectivity bias. *Journal of Political Economy* 82(6): 1119-1143.
- [33] Hall, Robert, and Susan Woodward. 2010. The burden of the nondiversifiable risk of entrepreneurship. *American Economic Review* 100 (3): 1163-1194.
- [34] Hamilton, Barton H. 2000. Does entrepreneurship pay? An empirical analysis of the returns to self-employment. *Journal of Political Economy* 108 (3): 604-631.
- [35] Harris, Ron. 2000. *Industrializing English Law: Entrepreneurship and Business Organization, 1720-1844*. New York: Cambridge University Press.
- [36] Hartog, Joop, Mirjam van Praag, and Justin van der Sluis. 2010. If you are so smart, why aren't you an entrepreneur? Returns to cognitive and social ability: Entrepreneurs versus employees. *Journal of Economics and Management Strategy* 19 (4): 947-989.
- [37] Heckman, James J. 1974. Shadow prices, market wages, and labor supply. *Econometrica* 42 (4): 679-694.
- [38] Heckman, James J., 2000. Policies to foster human capital. *Research in Economics*, Elsevier, vol. 54 (1): 3-56.
- [39] Heckman, James J., and Yona Rubinstein. The importance of noncognitive skills: Lessons from the GED testing program. *American Economic Review* 91 (May): 145-149.
- [40] Heckman, James J., N. Stixrud, and S. Urzua. 2006. The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior. *Journal of Labor Economics* 24 (3): 411-482.
- [41] Hipple, Steven F. 2010. Self-employment in the United States. *Monthly Labor Review* 113 (November): 17-32.

- [42] Holmes, Thomas J., and James A. Schmitz, Jr. 1990. A theory of entrepreneurship and its application to the study of business transfers. *Journal of Political Economy* 98 (April): 265-94.
- [43] Horvath, Paula, and Marvin Zuckerman. 1993. Sensation seeking, risk appraisal, and risky behavior. *Personality and Individual Differences* 14 (January): 41-52.
- [44] Holtz-Eakin, Douglas, David Joulfaian, and Harvey S. Rosen. 1994. Sticking it out: Entrepreneurial survival and liquidity constraints. *Journal of Political Economy* 102 (February): 53-75.
- [45] Hurst, Erik, Geng Li, and Benjamin W. Pugsley. 2010. Are household surveys like tax forms: Evidence from income underreporting of the self-employed. NBER Working Paper 16433.
- [46] Hurst, Erik, and Benjamin W. Pugsley. 2011. What do small businesses do? *Brookings Papers on Economic Activity* (Fall 2011): 73-118.
- [47] Jovanovic, Boyan. 1979. Job matching and the theory of turnover. *Journal of Political Economy* 87 (5): 972.
- [48] Kanbur, S. M. Ravi. 1982. Entrepreneurial risk taking, inequality, and public policy: An application of inequality decomposition analysis to the general equilibrium effects of progressive taxation. *Journal of Political Economy* 90 (February): 1-21.
- [49] Kihlstrom, Richard, and Jean-Jaques Laffont. 1979. A general equilibrium entrepreneurial theory of firm formation based on risk aversion. *Journal of Political Economy* 87 (August): 719-48.
- [50] King, Robert, and Ross Levine. 1993. Finance, entrepreneurship, and growth: Theory and evidence. *Journal of Monetary Economics* 32: 513-542.
- [51] Kushner, David. 2012. Machine Politics: The Man Who Started the Hacker Wars. *The New Yorker*, May 7.
- [52] Lazear, Edward P. 2005. Entrepreneurship. *Journal of Labor Economics* 23 (4): 649-680.
- [53] Lazear, Edward P. 2004. Balanced skills and entrepreneurship. *American Economic Review*, 94 (2): 208-211.
- [54] Lerner, Josh, Ann Leamon, and Felda Hardyman. 2012. *Venture Capital, Private Equity, and the Financing of Entrepreneurship*. New York: Wiley.

- [55] Lopez, Robert S. 1976. *The Commercial Revolution of the Middle Ages, 950-1350*. New York: Cambridge University Press.
- [56] Malmendier, Ulrike. 2009. Law and finance at the origin. *Journal of Economic Literature* 47: 1076-1108.
- [57] Manso, Gustavo. 2013. Experimentation and the returns to entrepreneurship. University of California, Berkeley, mimeo.
- [58] Meckling, William H., and Michael C. Jensen. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3: 305-70.
- [59] Moskowitz, Tobias, and Annette Vissing-Jorgensen. 2002. The returns to entrepreneurial investment: A private equity premium puzzle? *American Economic Review* 92 (4): 745-778.
- [60] Myers, Stewart C., and Nicholas S. Majluf. 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* 13: 187-222.
- [61] Mulligan Casey, B. and Yona Rubinstein. 2008. Selection, investment, and women's relative wages. *Quarterly Journal of Economics* 123 (3): 1061-1110.
- [62] Nicolaou, Nicos, Scott Shane, Lynn Cherkas, and Tim D. Spector. 2008. The influence of sensation seeking in the heritability of entrepreneurship. *Strategic Entrepreneurship Journal* 2 (March): 7-21.
- [63] Obschonka, Martin, Hakan Andersson, Rainer K. Silbereisen, and Magnus Sverke. 2013. Rule-breaking, crime, and entrepreneurship: A replication and extension study with 37-year longitudinal data. *Journal of Vocational Behavior* 83: 386-396.
- [64] Romer, Paul M. 1990. Endogenous technological change. *Journal of Political Economy* 98: S71-102.
- [65] Roy, Andrew D. 1951. Some thoughts on the distribution of earnings. *Oxford Economic Papers* 3: 135-146.
- [66] Schumpeter, Joseph. 1942. *Capitalism, Socialism and Democracy*. New York: Harper.
- [67] Smith, Adam. 1776. *An Inquiry into the Nature and Causes of the Wealth of Nations*. London: Methuen and Co.

- [68] Vereshchagnina, Galina, and Hugo Hopenhayn. 2009. Risk taking by entrepreneurs. *American Economic Review* 99 (5): 1808-30.
- [69] Welch, Ivo. 2011. *Corporate Finance*. New York: Prentice-Hall.
- [70] Willis, Robert J., and Sherwin Rosen. 1979. Education and self-selection. *Journal of Political Economy* 87 (5): 7-39.
- [71] Zuckerman, Marvin 1994. *Behavioral Expressions and Biosocial Bases of Sensation Seeking*. New York: Cambridge University Press.

**Table 1: Summary Statistics of Salaried and Self-Employed Workers, CPS**

	All	Salaried	Self Employed		
			All	Unincorporated	Incorporated
Observations	1097324 100%	987885 90%	109439 10%	70650 6%	38789 4%
<b>A. Demographics</b>					
Age	39.6	39.3	41.9	41.5	42.6
White	0.71	0.70	0.80	0.78	0.84
Black	0.11	0.12	0.05	0.06	0.04
Hispanic	0.12	0.12	0.08	0.10	0.05
Female	0.48	0.49	0.36	0.40	0.28
<b>B. Educational Attainment</b>					
Years of Schooling	13.7	13.7	13.9	13.6	14.5
High School Dropout	0.08	0.08	0.07	0.09	0.04
High School Graduate	0.31	0.32	0.30	0.32	0.24
Some College	0.28	0.28	0.27	0.28	0.26
College Graduate	0.21	0.21	0.23	0.20	0.29
Advanced Degree	0.11	0.11	0.13	0.11	0.17
College Graduate or More	0.32	0.32	0.36	0.31	0.46
<b>C. Labor Market Outcomes</b>					
Weeks	48.1	48.1	48.3	47.2	50.2
Annual Hours	1992	1981	2093	1952	2347
Full Time Full Year	0.75	0.75	0.69	0.62	0.82
Median Earnings	36648	36784	33965	24625	54972
Median Hourly Earnings	18.2	18.2	17.1	13.6	24.3

Notes: The table presents summary statistics from the March Annual Demographic Survey files of the Census Bureau's CPS for the work years 1994 through 2010, for prime age workers (25 through 55 years old), excluding people living within group quarters, with missing data on relevant demographics, with allocated earnings, and those working in agriculture or the military. The CPS classifies all workers in each year as either salaried or self-employed, and among the self-employed, they indicate whether the person is incorporated or unincorporated self-employed.



**Table 2: Employment Transitions from Last Year, CPS**

***Panel A: Transitions***

<b>This Year's Employment Type:</b>	<b>Last Year's Employment Type</b>			
	Salaried	Self Employed Incorporated	Self Employed Unincorporated	Not Working
Salaried	96.6	9.0	3.5	15.0
Self Employed Incorporated	0.8	86.3	0.1	0.4
Self Employed Unincorporated	0.6	4.1	94.4	1.8
Not Working	2.0	0.6	1.9	82.9

***Panel B: Earnings***

<b>This Year's Employment Type:</b>	<b>Last Year Year's Hourly Earnings (Median)</b>			
	Salaried	Self Employed Incorporated	Self Employed Unincorporated	Not Working
Salaried	22.7	25.8	13.5	--
Self Employed Incorporated	26.8	28.0	12.6	--
Self Employed Unincorporated	20.0	20.0	16.6	--
Not Working	15.6	23.8	13.9	--

**Table 2 (continued): Employment Transitions from Last Year, CPS****Panel C: Education**

<b>This Year's Employment Type:</b>	<b>Last Year Year's Years of Education (Means)</b>			
	Salaried	Self Employed Incorporated	Self Employed Unincorporated	Not Working
Salaried	14.0	14.3	13.5	12.9
Self Employed Incorporated	14.7	14.7	15.2	14.2
Self Employed Unincorporated	14.0	13.8	13.7	13.3
Not Working	13.2	13.6	12.9	12.2

Note: The table presents information on the characteristics of individuals transiting across employment types each year. The data include prime age (25-55) white males, over the work years from 1994 through 2010, and exclude the same individuals defined in the notes to Table 1. Panel A provides information on the percentage of workers of a particular employment type last and their employment type this year. Thus, 0.8% of salaried workers transit from salaried to incorporated self-employment in an average year. Panel B provides information on median hourly earnings last year for each of these transitions. Thus, the median hourly earnings last year of those that transited from salaried to incorporated self-employment was 26.8. Panel C provides information on the median years of education last year for each of these transition cells. Thus, the median years of education last year of those that transited from salaried to incorporated self-employment was 14.7.

**Table 3: Earnings Regressions by Employment Type, CPS**

	OLS	Quantile Regressions		
	Means	Q50	Q25	Q75
<i>Panel A: Self-employment, Aggregate</i>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
Self Employed	0.551* (0.302)	-3.589*** (0.076)	-5.816*** (0.065)	0.047 (0.105)
% Difference	1.9	-15.4	-35.6	0.1
<i>Panel B: Self-employment, by Type</i>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>
Incorporated	7.674*** (0.412)	0.886*** (0.104)	-1.949*** (0.094)	7.322*** (0.158)
Unincorporated	-5.716*** (0.310)	-6.937*** (0.100)	-8.410*** (0.091)	-4.785*** (0.153)
% Difference				
Incorporated	26.3	3.8	-11.9	21.6
Unincorporated	-19.6	-29.7	-51.4	-14.1
Observations	332822	332822	332822	332822

Notes: The table presents regression results of hour earnings on employment type. The Panel A regressions include a dummy variable, Self-employed, that equals one if the person is self-employed and zero otherwise. The Panel B regressions include and a second set of regressions where two dummy variables are included for whether the individual is Incorporated self-employed and Unincorporated self-employed. The data include prime age (25-55) white males, over the work years from 1994 through 2010, and exclude the same individuals defined in the notes to Table 1. The regressions control for year, state, industry, and occupation fixed effects as well as standard Mincerian characteristics: dummy variables for six education categories and a quartic expression for potential work experience. Standard errors are in parentheses. In the OLS regressions, the residuals are clustered at the individual level. For the quantile regressions, we confirm the reported findings when computing the bootstrapped standard errors of the coefficient estimates based on 500 random samples with replacement. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

**Table 4: Summary Statistics, NLSY79**

	<u>All</u>	<u>Salaried</u>	<u>Self Employed</u>		
			<u>All</u>	<u>Unincorporated</u>	<u>Incorporated</u>
Year-Person Observations	137481 100%	126889 92%	10592 8%	8904 6%	1688 1%
<b>A. Demographics</b>					
Age	35.4	35.3	36.2	35.9	37.5
White	0.80	0.80	0.87	0.86	0.90
Black	0.13	0.14	0.08	0.09	0.06
Hispanic	0.06	0.06	0.05	0.05	0.04
Female	0.47	0.47	0.38	0.41	0.27
<b>B. Educational Attainment</b>					
Years of Schooling	13.7	13.7	13.5	13.4	14.1
High School Dropout	0.07	0.07	0.08	0.09	0.04
GED	0.08	0.08	0.10	0.10	0.07
High School Graduate	0.34	0.34	0.33	0.33	0.30
Some College	0.24	0.24	0.24	0.24	0.25
College Graduate	0.15	0.15	0.14	0.13	0.20
Advanced Degree	0.13	0.14	0.11	0.10	0.14
College Graduate or More	0.28	0.28	0.25	0.23	0.34
<b>C. Labor Market Outcomes</b>					
Weeks	46	46	45	45	49
Annual Hours	1959	1947	2091	2005	2470
Full Time Full Year	0.63	0.64	0.57	0.53	0.75
Median earnings	34708	35036	30929	26292	57585
Median Hourly Earnings	16.9	17.0	15.1	13.5	24.0

**Table 4 (continued): Summary Statistics, NLSY**

	All	Salaried	Self Employed		
			All	Unincorporated	Incorporated
<b>D. Pre-labor market: Background, traits, aspirations, and activities</b>					
Mother's Education	11.7	11.6	11.9	11.8	12.5
Father's Education	11.9	11.9	12.2	12.1	12.6
Two parents family (14)	0.76	0.76	0.77	0.75	0.82
Family Income in 1979	67337	66773	73672	70617	87428
AFQT	51.0	50.9	51.4	50.6	55.2
Rotter Locus of Control (standardized)	-0.03	-0.02	-0.12	-0.10	-0.22
Rosenberg Self-Esteem (standardized)	0.04	0.04	0.08	0.04	0.27
Managerial aspirations	5%	5%	7%	6%	10%
Professional aspirations	33%	33%	32%	31%	35%
Illicit Activity Index (standardized)	0.00	-0.01	0.11	0.08	0.21
Force (raw)	0.05	0.04	0.06	0.06	0.08
Steal 50 or less (raw)	0.21	0.21	0.23	0.23	0.26
Stopped by Police (raw)	0.19	0.18	0.22	0.21	0.26
<b>E. Self-designation and innovative activities (2010)</b>					
Entrepreneur	19%	17%	48%	44%	65%
Entrepreneur Residual (standardized)	0.00	-0.07	0.72	0.63	1.10
Applied for patent	2%	2%	3%	2%	5%
Applied for Patent Residual (standardized)	0.00	0.00	0.07	0.04	0.21

Notes: This table provides summary statistics from the NLSY79 on people who are at least 25 years old and in the work force. This covers the NLSY79 work years 1982 through 2010. Pre-labor traits are measured in 1979 and in 1980, which is before anyone in the NLSY79 sample enters prime age. Mother's Education and Father's Education are the number of years of education of the person's mother and father respectively. Two Parents Family (14) equals one if the person had two parents living at home when he or she was 14 years old and zero otherwise. Family Income in 1979 is the income of the person's family in 1979. AFQT is a measure of cognitive ability; Rotter Locus of Control measures the degree to which a person feels luck, fate, and external factors control events relative to the extent that internal factors give the person self-determination over his or life, such that negative values imply a greater sense of internal control; and Rosenberg Self-Esteem measures the self-esteem of the individual based on a psychometric test. The Illicit Index, which is computed in 1980, measures the degree to which an individual engaged in an array of aggressive, risk-taking, and illicit activities, including taking things by force (Force), stealing, including items less than \$50 (Steal 50 or less), and whether the person was stopped by the police (Stopped by Police). Managerial aspirations measures the percentage of people within each employment type that in 1979 answered "managers, officials, and proprietors" in response to the question, "What type of job would you most like to be trained for?" Professional aspirations measures the percentage of people within each employment type that in 1979 answered "professional, technical, and kindred" in response to the question, "What type of job would you most like to be trained for?" Entrepreneur measures the percentage of people within each employment type that in 2010 answered "yes" to the question, "Do you consider yourself to be an entrepreneur (where an entrepreneur is defined by the questioner as someone who launches a business enterprise, usually with considerable initiative and risk)?" Applied for Patent measures the percentage of people within each employment type that in 2010 answered "yes" to the question, "Has anyone, including yourself, ever applied for a patent for work that you significantly contributed to? We also compute Entrepreneur Residual (standardized) and Applied for Patent Residual (standardized). These are computed by standardizing the residuals from regressing Entrepreneur and Applied for Patent on dummy variables for education (six categories), race, gender, and year of birth.

---

---

Table 5: Selection into Employment Types on Cognitive, Noncognitive, and Family Traits, NLSY79

<i>Self-Employment by Type:</i>	<u>All (vs. Salaried)</u>		<u>By Type (vs. Salaried)</u>			
	<u>(1)</u>	<u>(2)</u>	<u>Unincorporated</u>		<u>Incorporated</u>	
			<u>(3)</u>	<u>(4)</u>	<u>(5)</u>	<u>(6)</u>
<b>Demographics</b>						
Female	-0.369*** (0.055)	-0.338*** (0.056)	-0.302*** (0.058)	-0.262*** (0.059)	-0.741*** (0.124)	-0.755*** (0.125)
Black	-0.626*** (0.073)	-0.574*** (0.074)	-0.594*** (0.075)	-0.533*** (0.075)	-0.887*** (0.164)	-0.925*** (0.164)
Hispanic	-0.234*** (0.082)	-0.194** (0.082)	-0.279*** (0.086)	-0.228*** (0.086)	-0.062 (0.182)	-0.082 (0.188)
<b>Cognitive and Non-Cognitive Traits</b>						
High AFQT	-0.134* (0.078)	0.005 (0.079)	-0.105 (0.081)	0.072 (0.083)	-0.272 (0.176)	-0.317* (0.177)
High Illicit	0.048 (0.073)	0.004 (0.073)	0.063 (0.075)	0.015 (0.075)	-0.026 (0.179)	-0.037 (0.180)
High AFQT * High Illicit	0.091 (0.110)	0.090 (0.110)	-0.033 (0.118)	-0.038 (0.117)	0.581** (0.234)	0.572** (0.235)
Rotter Score	-0.079*** (0.028)	-0.092*** (0.028)	-0.074** (0.030)	-0.088*** (0.030)	-0.107* (0.058)	-0.109* (0.057)
Rosenberg Score	0.001 (0.028)	0.026 (0.029)	-0.033 (0.030)	-0.001 (0.031)	0.184*** (0.059)	0.176*** (0.060)
<b>Family Background</b>						
Mother education	0.020 (0.013)	0.029** (0.013)	0.009 (0.013)	0.019 (0.014)	0.086*** (0.027)	0.087*** (0.028)
Father education	0.001 (0.010)	0.009 (0.010)	0.002 (0.010)	0.013 (0.011)	-0.009 (0.022)	-0.012 (0.022)
Family income (in 1979) (in 100K)	0.149 (0.098)	0.190* (0.098)	0.045 (0.109)	0.095 (0.109)	0.556*** (0.176)	0.560*** (0.176)
Both parents at home (14)	-0.048 (0.060)	-0.014 (0.060)	-0.079 (0.062)	-0.040 (0.063)	0.163 (0.138)	0.166 (0.139)
<b>Controlling for education</b>	No	Yes	No	Yes	No	Yes
<b>Observations</b>	119958	119958	119958	119958	119958	119958

Note: This table reports multinomial logit estimates of the probability of a worker, 25 years of age or older, to be self-employed. All dummy variables are defined exclusively. Salaried workers are the excluded category. Persons who do not work either as salaried or as self-employed are deleted. High AFQT equals one if the individual has an above average AFQT score and zero otherwise. High Illicit equals one if the person has an above average Illicit Activity Index and zero otherwise. We also exclude observations with missing demographics (gender, race and ethnicity, schooling) or missing values for AFQT, Rosenberg Self-Esteem, Rotter Locus of Control and Illicit Activity Index. Though unreported in the table, the odd numbered regressions include year of birth, year of survey, a quartic in age, and dummy variables for individuals with missing family income (for which we impute the average value in the sample) and missing parental education (for which we impute values based on the other parent's education and the average for the sample if no parental education is reported). The even columns include, in addition, educational attainment (six categories) and quartic for potential experience. Reported standard errors (in parentheses) are corrected for heteroskedasticity and clustering by individual.

Table 6: Selection into Employment Types on Salaried Wages, NLSY79

<i>Self-Employment by Type:</i>	<b>All (vs. Salaried)</b>		<b>By Type (vs. Salaried)</b>			
	<b>(1)</b>	<b>(2)</b>	<b>Unincorporated</b>		<b>Incorporated</b>	
			<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>
Adjusted Hourly Wage (logs)	-0.597*** (0.150)	-0.686*** (0.200)	-0.918*** (0.151)	-0.850*** (0.207)	0.818** (0.323)	0.095 (0.449)
High Illicit (above average)	0.091 (0.096)	0.105 (0.098)	0.021 (0.102)	-0.001 (0.107)	0.358* (0.184)	0.202 (0.188)
Adjusted Hourly Wage * High Illicit		0.176 (0.258)		-0.138 (0.254)		1.381** (0.575)
AFQT	0.001 (0.002)	0.001 (0.002)	0.003 (0.002)	0.003 (0.002)	-0.007 (0.004)	-0.006 (0.004)
Rotter Score	-0.107** (0.050)	-0.108** (0.050)	-0.117** (0.054)	-0.117** (0.054)	-0.053 (0.093)	-0.055 (0.094)
Rosenberg Score	0.031 (0.052)	0.031 (0.052)	-0.011 (0.057)	-0.011 (0.057)	0.198** (0.083)	0.197** (0.083)
<b>Family Background</b>						
Mother education	0.030 (0.025)	0.030 (0.025)	0.001 (0.027)	0.001 (0.027)	0.130*** (0.047)	0.133*** (0.047)
Father education	-0.016 (0.019)	-0.016 (0.019)	0.001 (0.020)	0.001 (0.020)	-0.079** (0.037)	-0.080** (0.038)
Family income (in 1979) (in 100K)	0.300* (0.171)	0.298* (0.172)	0.250 (0.200)	0.252 (0.200)	0.418 (0.268)	0.408 (0.272)
Both parents at home (14)	0.222* (0.114)	0.217* (0.114)	0.191 (0.122)	0.195 (0.122)	0.363 (0.232)	0.347 (0.232)
Observations	33619	33619	33619	33619	33619	33619

Note: This table reports multinomial logit estimates of the probability of a worker, 25 years of age or older, to be self-employed. All dummy variables are defined exclusively. Salaried workers are the excluded category. The Adjusted Hourly Wage equals the average hourly wage of a person after conditioning out experience, year, industry, and occupation effects. High Wage equals one if the individual has an above average Adjusted Hourly Wage and zero otherwise. High Illicit equals one if the person has an above average Illicit Activity Index and zero otherwise. Though unreported in the table, the regressions include year of birth, year of survey, a quartic in experience, educational attainment (six categories), and dummy variables for individuals with missing family income (for which we impute the average value in the sample) and missing parental education (for which we impute values based on the other parent's education and the average for the sample if no parental education is reported). Persons who do not work either as salaried or as self-employed are deleted. We also exclude observations with missing demographics (gender, race and ethnicity, schooling) or missing values for AFQT, Rosenberg Self-Esteem, Rotter Locus of Control and Illicit behavior. Reported standard errors (in parentheses) are corrected for heteroskedasticity and clustering by individual.



Table 7: Transitions, Earnings and Pre-Determined Traits, NLSY79

This Year	Two Years Ago			
	Salaried	Self-employed Incorporated	Self-employed Unincorporated	Not Working
<i>Panel A: Proportions</i>				
Salaried	<b>93.9</b>	<b>30.1</b>	<b>34.0</b>	<b>32.6</b>
Self-employed Incorporated	<b>0.8</b>	<b>60.4</b>	<b>3.1</b>	<b>0.5</b>
Self-employed Unincorporated	<b>3.4</b>	<b>7.9</b>	<b>60.1</b>	<b>3.2</b>
Not Working (including family business)	<b>1.9</b>	<b>1.7</b>	<b>2.8</b>	<b>63.6</b>
	100.0	100.0	100.0	100.0
<i>Panel B: Hourly Earnings</i>				
<i>Hourly Earnings Two Years Ago</i>				
Salaried	<b>21.1</b>	<b>23.5</b>	<b>16.5</b>	--
Self-employed Incorporated	<b>24.7</b>	<b>31.0</b>	<b>22.8</b>	--
Self-employed Unincorporated	<b>17.2</b>	<b>14.7</b>	<b>18.9</b>	--
Not Working	<b>22.9</b>	<b>29.3</b>	<b>19.5</b>	--
<i>Panel C: Cognitive and Non-Cognitive</i>				
<i>AFQT</i>				
Salaried	<b>57.3</b>	<b>61.2</b>	<b>52.8</b>	<b>53.3</b>
Self-employed Incorporated	<b>60.5</b>	<b>56.5</b>	<b>54.0</b>	<b>57.1</b>
Self-employed Unincorporated	<b>53.3</b>	<b>53.5</b>	<b>54.7</b>	<b>46.6</b>
Not Working	<b>43.2</b>	<b>54.6</b>	<b>41.5</b>	<b>48.3</b>
<i>Self Esteem (standardized)</i>				

Salaried	<b>0.11</b>	<b>0.24</b>	<b>0.03</b>	<b>0.01</b>
Self-employed Incorporated	<b>0.24</b>	<b>0.34</b>	<b>0.20</b>	<b>0.67</b>
Self-employed Unincorporated	<b>0.04</b>	<b>0.18</b>	<b>0.03</b>	<b>0.13</b>
Not Working	<b>-0.11</b>	<b>0.67</b>	<b>-0.11</b>	<b>-0.10</b>

*Locus of Control (standardized)*

---

Salaried	<b>-0.10</b>	<b>-0.14</b>	<b>-0.08</b>	<b>-0.06</b>
Self-employed Incorporated	<b>-0.14</b>	<b>-0.26</b>	<b>-0.42</b>	<b>-0.17</b>
Self-employed Unincorporated	<b>-0.09</b>	<b>-0.35</b>	<b>-0.14</b>	<b>-0.02</b>
Not Working	<b>0.09</b>	<b>-0.25</b>	<b>-0.05</b>	<b>0.10</b>

*Illicit*

---

Salaried	<b>0.20</b>	<b>0.25</b>	<b>0.24</b>	<b>0.26</b>
Self-employed Incorporated	<b>0.26</b>	<b>0.22</b>	<b>0.24</b>	<b>0.19</b>
Self-employed Unincorporated	<b>0.24</b>	<b>0.21</b>	<b>0.20</b>	<b>0.29</b>
Not Working	<b>0.27</b>	<b>0.22</b>	<b>0.28</b>	<b>0.24</b>

---

Note: The table presents information on the characteristics of individuals transiting across employment types each year. From the NLSY9, the data include prime age (25-55) white males, over the work years from 1994 through 2010. The “not working” category includes those working in “family business” (0.6% of the sample). Panel A provides information on the percentage of workers of a particular employment type last and their employment type this year. Thus, 0.8% of salaried workers transit from salaried to incorporated self-employment in an average year. Panel B provides information on median hourly earnings last year for each of these transitions. Thus, the median hourly earnings last year of those that transited from salaried to incorporated self-employment was 24.7. Panel C provides information on the mean AFQT, Rotter Locus of Control and Rosenberg Self Esteem (standardized) of people switching among the indicated employment types. Thus, the mean AFQT of those that transited from salaried to incorporated self-employment was 60.5. Panel D provides information on the mean Self-esteem (standardized) of people switching among the indicated employment types. Thus, the median self-esteem of those that transited from salaried to incorporated self-employment was 0.24 standard deviation above the mean.

**Table 8: Hourly Earnings and Individual Effects, NLSY79**

<i>Dependent Variable</i>	Mean						Median				
	Hourly Earnings		Change in Hourly Earnings				Hourly Earnings		Change Hourly Earnings		
			2 YRS		4 YRS				2 YRS		4 YRS
<i>Panel A: All</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
Self Employed	2.707*** (0.989)	0.838 (0.894)	0.649 (0.767)	1.102 (0.965)	1.750* (0.945)	2.350* (1.248)	-0.880*** (0.268)	-0.190 (0.138)	-0.542*** (0.202)	-0.859*** (0.251)	
<i>% Difference with salaried workers</i>	11.2	3.5	2.7	4.5	7.2	9.7	-4.4	-0.9	-2.7	-4.3	
<i>Panel B: Incorporated and Unincorporated</i>	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	
Incorporated	11.676*** (2.064)	4.382** (1.925)	4.329** (2.064)	4.194* (2.203)	5.310** (2.063)	5.321** (2.428)	5.553*** (0.481)	1.294*** (0.248)	0.696** (0.349)	1.939*** (0.427)	
Unincorporated	-0.431 (0.963)	-0.483 (0.796)	-0.680 (0.728)	-0.054 (0.935)	0.330 (0.932)	1.029 (1.272)	-2.412*** (0.299)	-0.589*** (0.154)	-0.836*** (0.227)	-1.713*** (0.291)	
<i>% Difference with salaried workers</i>											
Incorporated	48.2	18.1	17.9	17.3	21.9	22.0	27.6	6.4	3.5	9.6	
Unincorporated	-1.8	-2.0	-2.8	-0.2	1.3	3.4	-12.0	-2.9	-4.2	-8.5	
Individual effects	No	Yes	No	Yes	No	Yes	No	Yes^	No	No	
Sample age	25+	25+	27+	27+	29+	29+	25+	25+	27+	29+	
Observations	24888	24888	18518	18518	15061	15061	24888	24888	18518	15061	

Note: This table reports OLS and quantile regressions for white males working full-time, full-year. All dummy variables are defined exclusively. Salaried workers are the excluded category. Thus, in the regressions in which the dependent variable is Hourly Earnings, the dummy variable for Self-Employed equals one in the years that a person is self-employed and zero otherwise, Incorporated equals one in the years that a person is incorporated self-employed and zero otherwise, and Unincorporated equals one in the years that a person is unincorporated and zero otherwise. In the regression in which the dependent variable is the Change in Hourly Earnings, the dummy variable for Self-Employed equals one if a person is self-employed this year but was not self-employed two (or four) years go, equals negative one if the person is not self-employed this year but was self-employed two (or four) years ago, and equals zero if the person did not change employment status. In the Change in Hourly Earnings regressions that differentiate among self-employment types the regressors are defined similarly, so that Incorporated equals one if a person is incorporated this year but was not incorporated two (or four) years go, equals negative one if the person is not incorporated this year but was two (or four) years ago, and equals zero if the person did not change into or out of incorporated self-employment. All specifications control for year, industry, and occupation fixed effects as well as standard Mincerian characteristics: dummy variables for six education categories and a quartic expression for potential work experience. The dependent variable in columns (8) and (18) is the difference from each person's median hourly earnings. The sample includes observations of reported zero earnings by the self-employed. The sample mean and median hourly earnings of salaried workers are 24.2 and 20.1 respectively. For the years in which an individual does not work either as salaried or as self-employed, those observations are excluded. Standard errors are in parentheses. In the OLS regressions, the reported standard errors are clustered at the individual level and corrected for heteroskedasticity. For the quantile regressions, we confirm the reported findings when computing the bootstrapped standard errors of the coefficient estimates based on 500 random samples with replacement. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

**Table 9: Instrumental Variables Estimates of Hourly Earnings, NLSY79**

	OLS		2SLS	
	No	Yes	No	Yes
<b><i>Controlling for Person FE</i></b>				
Incorporated	<b>11.779***</b> (2.209)	<b>4.289***</b> (0.738)	<b>18.393***</b> (3.511)	<b>5.296***</b> (2.052)
Unincorporated	<b>-0.610</b> (1.047)	<b>-0.504</b> (0.497)	<b>-1.357</b> (1.714)	<b>-0.342</b> (1.794)
<b><i>% Difference from Salaried Worker Mean Wages</i></b>				
Incorporated	<b>48.6%</b>	<b>17.7%</b>	<b>75.9%</b>	<b>21.9%</b>
Unincorporated	<b>-2.5%</b>	<b>-2.1%</b>	<b>-5.6%</b>	<b>-1.4%</b>
<b><i>First Stage</i></b>				
	Incorporated			
Incorporated two years ago	--	--	<b>0.640***</b> (0.023)	<b>0.372***</b> (0.007)
Unincorporated two years ago	--	--	<b>0.019***</b> (0.005)	<b>0.006</b> (0.004)
	Un Incorporated			
Incorporated two years ago	--	--	<b>0.019</b> (0.013)	<b>-0.040***</b> (0.011)
Un Incorporated two years ago	--	--	<b>0.604***</b> (0.015)	<b>0.269***</b> (0.007)
Year Person Observations	21858	21858	21858	21858

Note: This table reports OLS and 2SLS regressions for white males working full-time, full-year. The instrument variables for incorporated and unincorporated are two dummy variables, where Incorporated Two Years Ago equals one if the person is incorporated self-employed two years earlier and zero otherwise and Unincorporated Two Years Ago equals one if the person is unincorporated two years earlier and zero otherwise. Consequently, the minimum age is 27 years. The sample includes observations of reported zero earnings by the self-employed. All dummy variables are defined exclusively. Salaried workers are the excluded category. For the years in which an individual does not work either as salaried or as self-employed, those observations are excluded. All specifications control for year, industry, and occupation fixed effects as well as standard Mincerian characteristics: dummy variables for six education categories and a quartic expression for potential work experience. The sample mean hourly earnings of salaried workers is 24.2. Standard errors are in parentheses. In the OLS regressions, the reported standard errors are clustered at the individual level and corrected for heteroskedasticity. For the quantile regressions, we confirm the reported findings when computing the bootstrapped standard errors of the coefficient estimates based on 500 random samples with replacement. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

**Table 10: Hourly Earnings by Current and Past Employment Type**

<i>Controlling for Person FE</i>	Mean				Median			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Type of worker</i>								
<b>Incorporated</b>	11.779*** (2.209)	9.272*** (2.018)	4.289*** (1.595)	3.879** (1.614)	5.300*** (0.509)	5.037*** (0.593)	1.427*** (0.267)	1.432*** (0.303)
<b>Unincorporated</b>	-0.610 (1.047)	0.281 (1.040)	-0.504 (0.683)	-0.426 (0.684)	-2.572*** (0.321)	-1.770*** (0.357)	-0.771*** (0.168)	-0.810*** (0.183)
<b>Incorporated Past</b>		4.671*** (1.657)		2.414* (1.373)		1.458*** (0.389)		-0.063 (0.199)
<b>Unincorporated Past</b>		-1.959*** (0.668)		-1.734** (0.829)		-1.393*** (0.218)		0.074 (0.111)
<i>% Difference from Salaried Worker Mean Wages</i>								
<b>Incorporated</b>	48.6%	38.3%	17.7%	16.0%	26.3%	25.0%	7.1%	7.1%
<b>Unincorporated</b>	-2.5%	1.2%	-2.1%	-1.8%	-12.8%	-8.8%	-3.8%	-4.0%
<b>Individual Effects</b>	No	No	Yes	Yes	No	No	Yes^	Yes^
<b>Year Person Observations</b>	21858	21858	21858	21858	21858	21858	21858	21858

Note: This table reports OLS and quantile regressions for white males working full-time, full-year. All dummy variables are defined exclusively. Salaried workers are the excluded category. Incorporated Past equals one in the years after an individual becomes incorporated, even if the person switches to a different employment type, and equals zero before a person becomes incorporated self-employed. Unincorporated Past equals one in the years after an individual becomes unincorporated, even if the person switches to a different employment type, and equals zero before a person becomes unincorporated self-employed. The dependent variable in columns (7) and (8) is the difference from each person median hourly earnings. All specifications control for year, industry, and occupation fixed

effects as well as standard Mincerian characteristics: dummy variables for six education categories and a quartic expression for potential work experience. The sample includes observations of reported zero earnings by the self-employed. For the years in which an individual does not work either as salaried or as self-employed, those observations are excluded. The sample mean and median hourly earnings of salaried workers are 24.2 and 20.1 respectively. Standard errors are in parentheses. In the OLS regressions, the reported standard errors are clustered at the individual level and corrected for heteroskedasticity. For the quantile regressions, we confirm the reported findings when computing the bootstrapped standard errors of the coefficient estimates based on 500 random samples with replacement. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

Table 11: Change in Hourly Earnings when Switching Employment Type by Illicit Activity and Salaried Wages

	All	Low Wage- Low Illicit	Low Wage- High Illicit	High Wage- Low Illicit	High Wage- High Illicit
	(1)	(2)	(3)	(4)	(5)
D Incorporated (t-4 and t)	2.017*** (0.456)	-1.205 (0.832)	-1.401 (0.900)	2.720** (1.115)	5.741*** (0.920)
D Unincorporated (t-4 and t)	-1.858*** (0.316)	-2.776*** (0.443)	-2.645*** (0.508)	-1.283 (0.796)	0.408 (0.902)
<i>% Difference from Salaried Worker Mean Wages</i>					
D Incorporated	<b>9.6%</b>	<b>-5.7%</b>	<b>-6.7%</b>	<b>12.9%</b>	<b>27.3%</b>
D Unincorporated	<b>-8.8%</b>	<b>-13.2%</b>	<b>-12.6%</b>	<b>-6.1%</b>	<b>1.9%</b>
Year Person Observations	13351	3295	2337	4437	3282

Note: This table provides estimates of the change in residual hourly earnings associated with changes of employment type, while splitting the sample based on the person's history of illicit activity as a youth and the person's salaried wages. In particular, a person is classified as High Wage if he earned above the average residual wages as a salaried worker and Low Wage if he earned below the average. A person is classified as High Illicit if he engaged in above the average amount of illicit activities as reported in 1979 and Low Illicit otherwise. Based on these classifications, the table reports the results of regressing changes in earnings over a four-year horizon on changes of employment type for four subsamples and the full sample. Specifically, D Incorporated equals: one if the person is incorporated this year but was not incorporated four years ago; negative one if the person is not incorporated this year but was incorporated four years ago; and zero if the person did not change into our out of incorporated self-employment from four years ago to this year. And, correspondingly, D Unincorporated equals: one if the person is unincorporated this year but was not unincorporated four years ago; negative one if the person is not unincorporated this year but was unincorporated four years ago; and zero if the person did not change into our out of unincorporated self-employment from four years ago to this year. The table reports quantile regressions for white males working full-time, full-year this year and four years ago. All dummy variables are defined exclusively. Salaried workers are the excluded category. The sample includes observations of reported zero earnings by the self-employed. For the years in which an individual does not work either as salaried or as self-employed, those observations are excluded. All specifications control for year, industry, and occupation fixed effects as well as standard Mincerian characteristics: dummy variables for six education categories and a quartic expression for potential work experience. The sample median hourly earnings of salaried workers is 20.1. Standard errors are in parentheses. We confirm the reported findings when computing the bootstrapped standard errors of the coefficient estimates based on 500 random samples with replacement. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

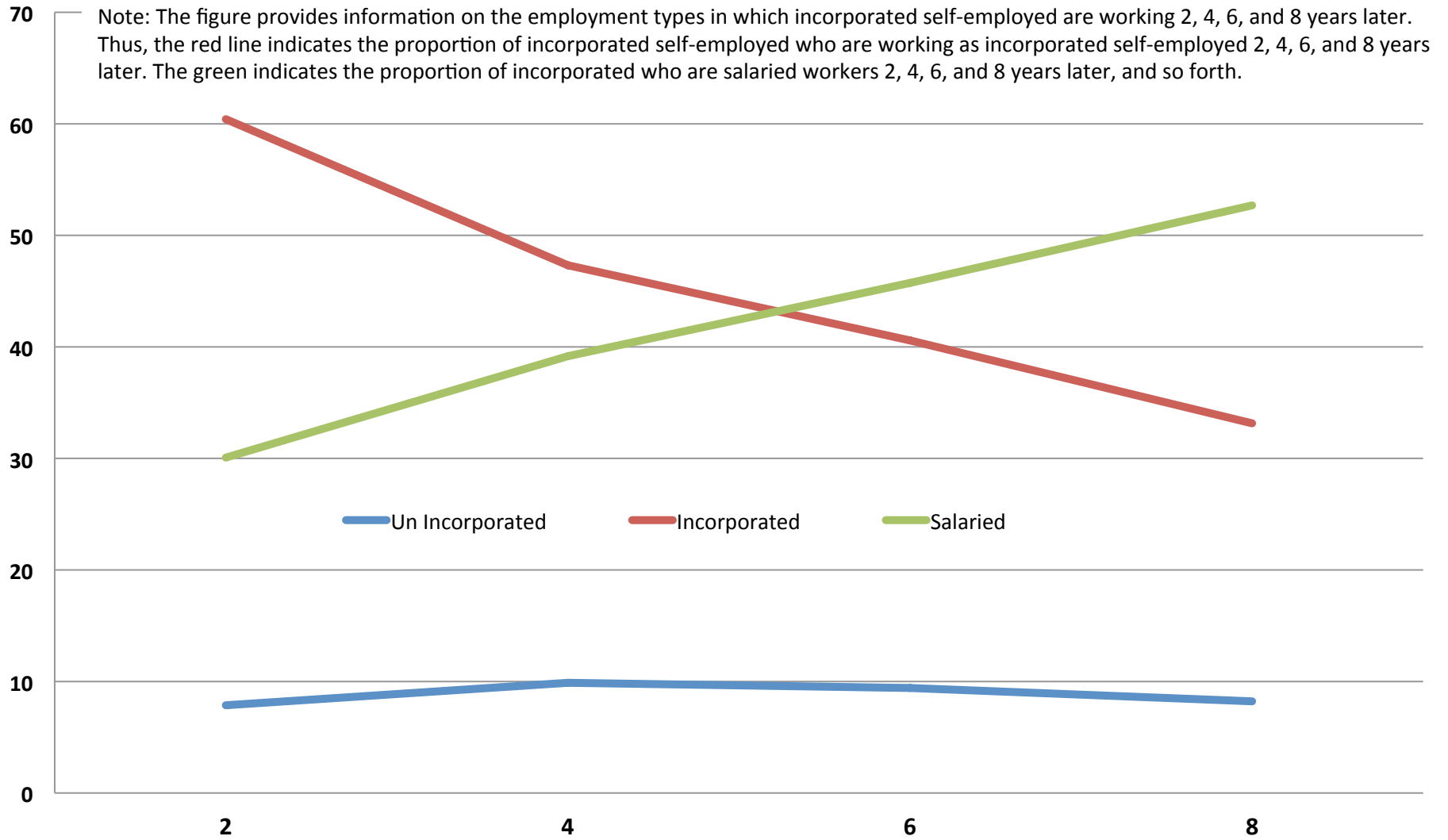


**Table 12: Annual Hours Worked by Type of Employment**

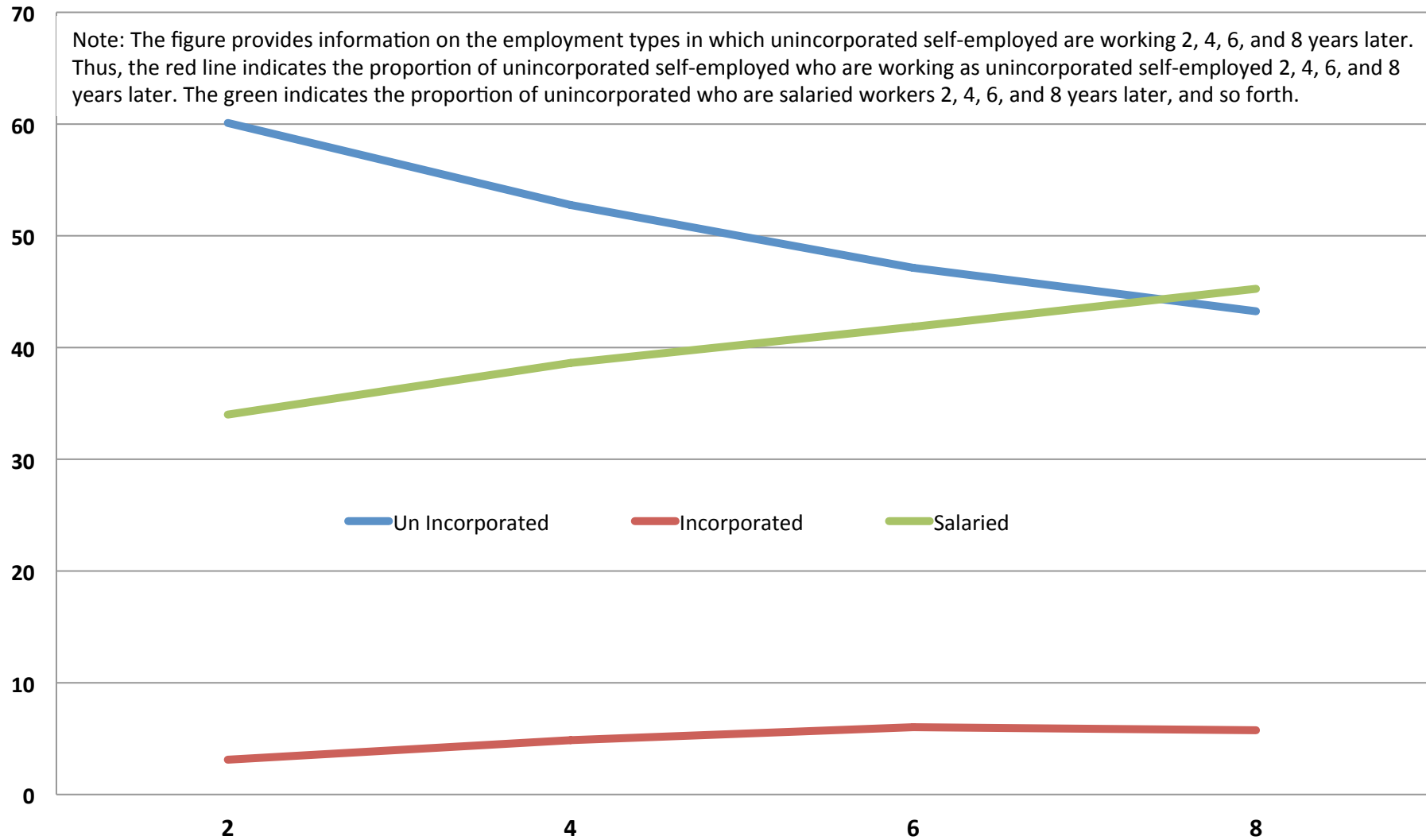
	All Workers		Full-Time Full-Year	
Incorporated	<b>356.146***</b> (48.615)	<b>131.584***</b> (44.268)	<b>340.309***</b> (46.018)	<b>144.394***</b> (42.626)
Unincorporated	<b>178.685***</b> (29.656)	<b>97.036***</b> (28.283)	<b>284.978***</b> (28.825)	<b>140.149***</b> (28.368)
<b><i>Controlling for Person FE</i></b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>
Year Person Observations	34288	25523	34288	25523

Note: This table provides estimates of the mean annual hours worked by salaried and self-employed incorporated and unincorporated workers. All dummy variables are defined exclusively. Salaried workers are the excluded category. All specifications control for year, industry, and occupation fixed effects as well as standard Mincerian characteristics: dummy variables for six education categories and a quartic expression for potential work experience, as well as AFQT, Self-Esteem, Rotter Locus of Control and an Illicit Activity Index. The reported standard errors in parentheses are clustered at the individual level and corrected for heteroskedasticity. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

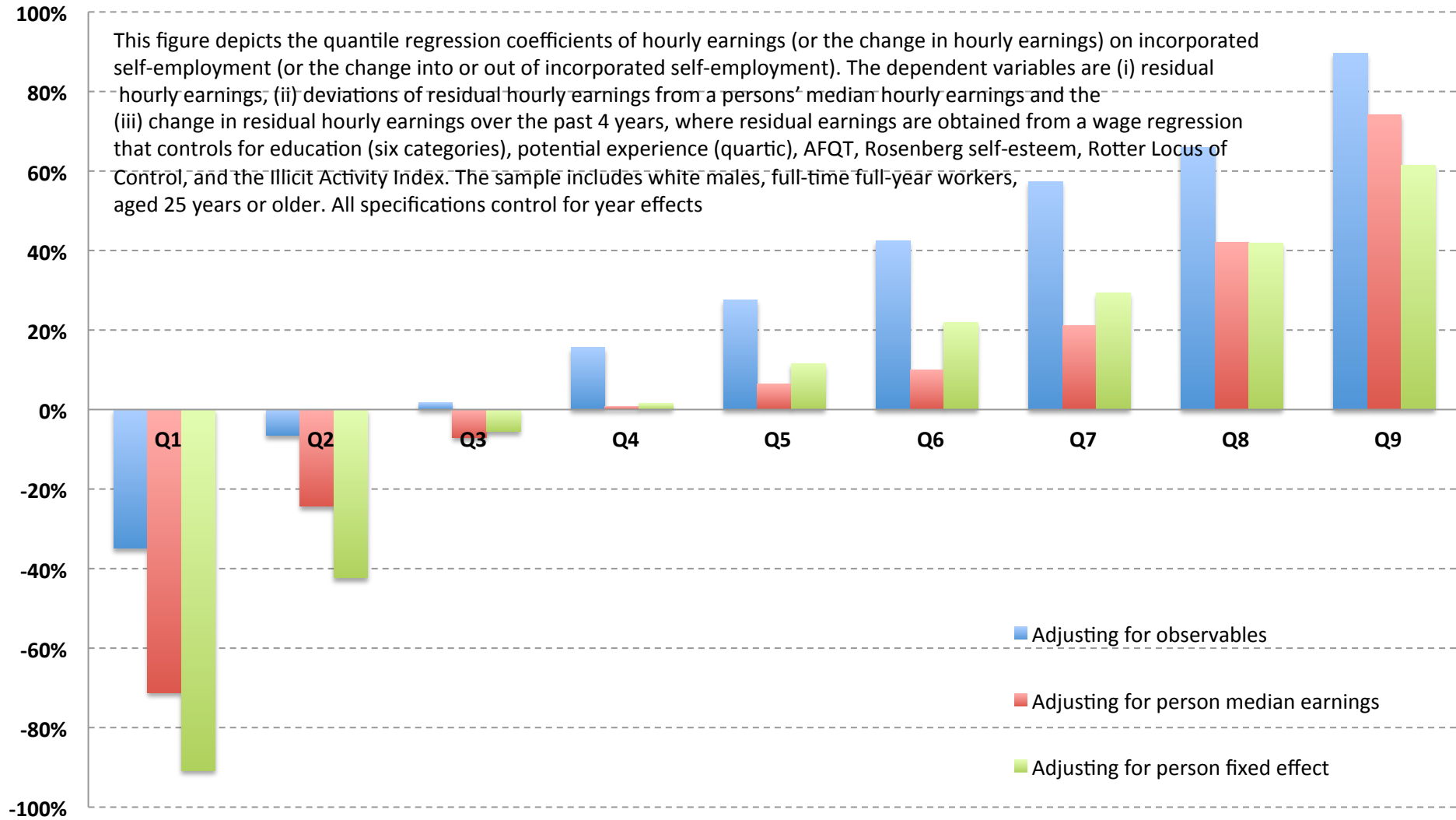
**Figure 1a: Incorporated Workers 2, 4, 6 and 8 Years Later**



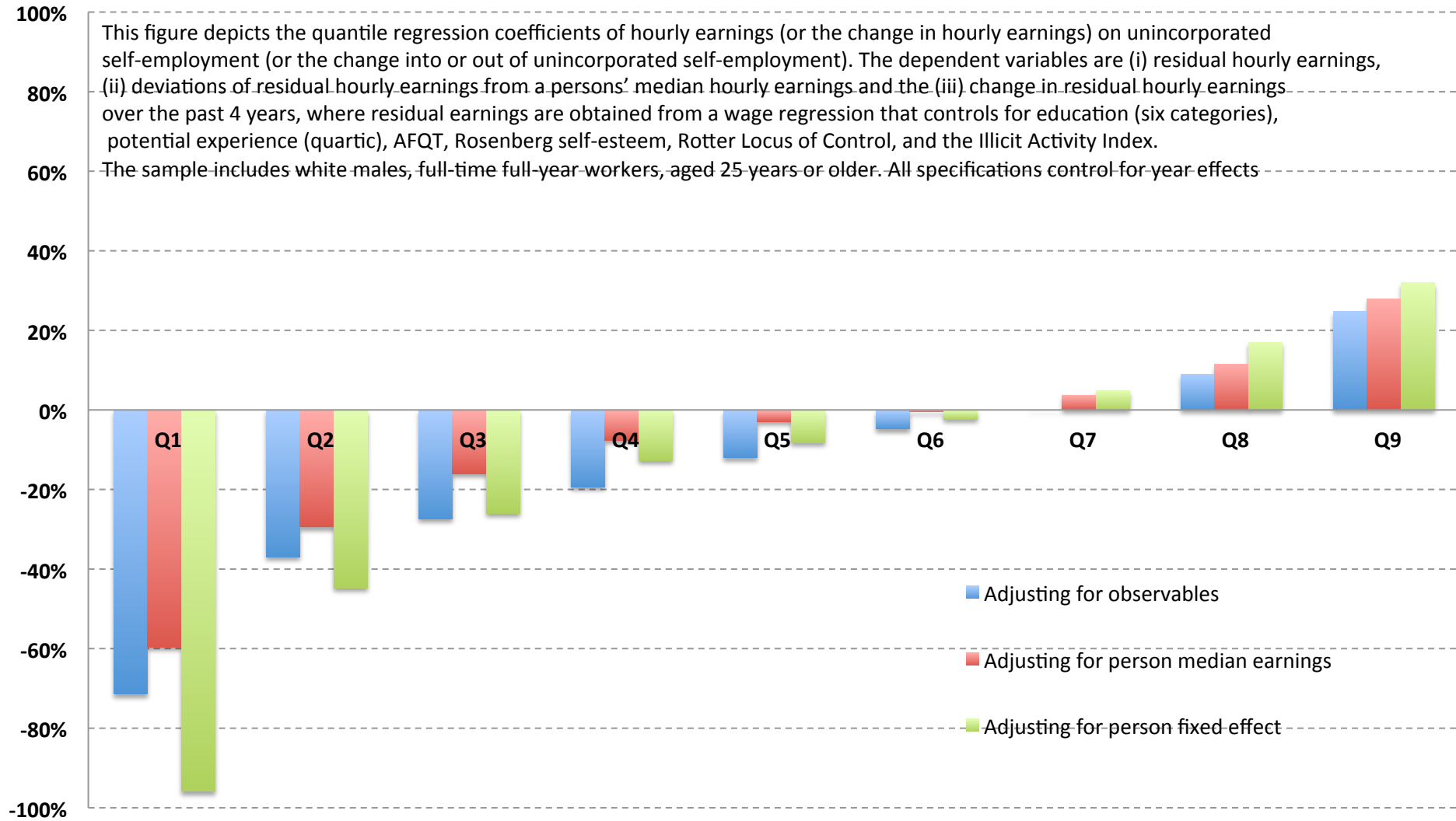
**Figure 1b: Unincorporated Workers 2, 4, 6 and 8 Years Later**

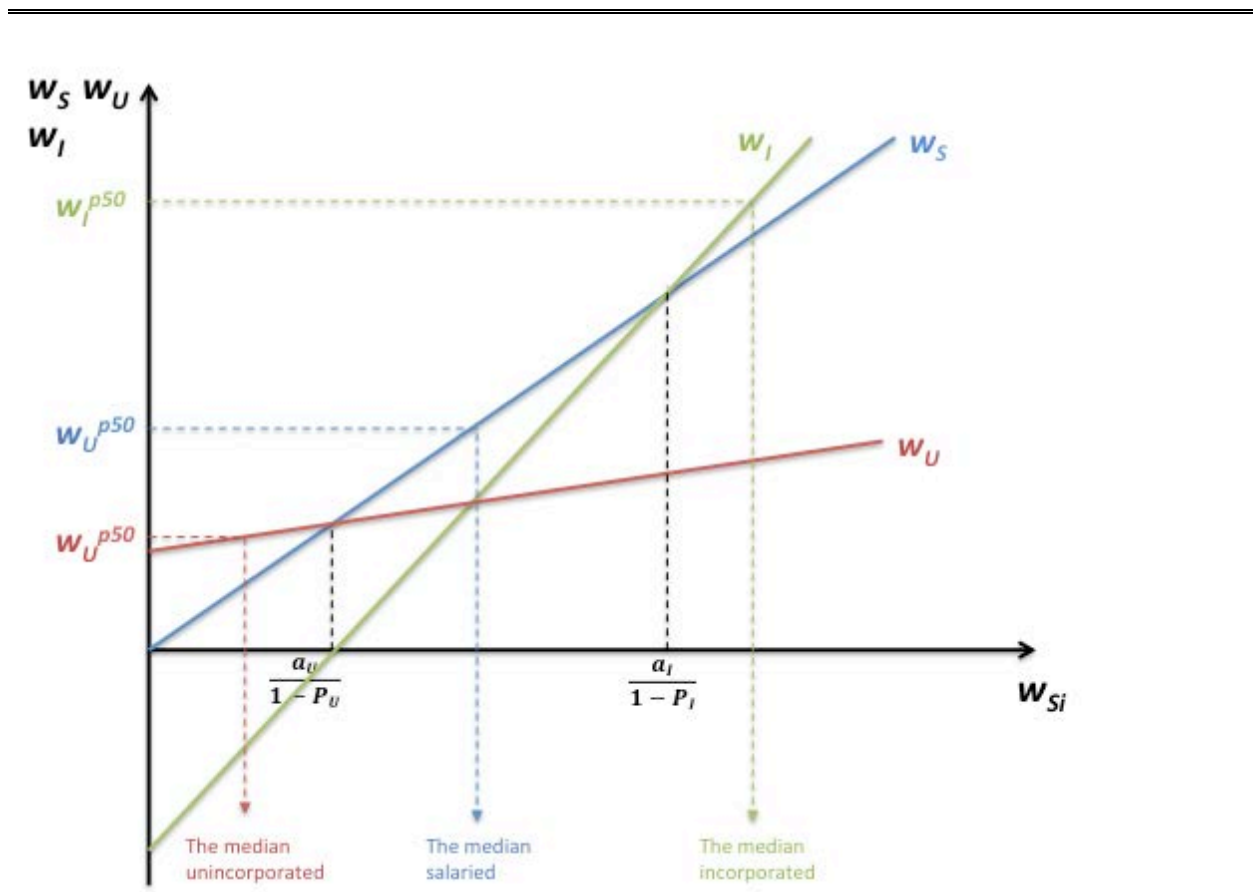


**Figure 2a: Hourly Earnings Gap between Incorporated and Salaried**



**Figure 2b: Hourly Earnings Gap between Unincorporated and Salaried**



**Figure 3: Sorting into Employment Types and Comparative Earnings**


Note: Based on the model developed in the text, this figure graphs the potential earnings of an individual with particular cognitive and noncognitive traits as (1) incorporated self-employed (indicated by the  $W_I$ ), (2) unincorporated self-employed (indicated by the  $W_U$  line), or (3) a salaried worker (indicated by the  $W_S$  line). Consistent with the empirical findings, the slope of the  $W_I$  line is steeper than the unincorporated and salaried earnings lines because incorporated self-employment is a comparatively human capital-intensive activity. Also consistent with the empirical evidence, the slope of the  $W_U$  line is flatter than the incorporated and salaried earning lines as unincorporated self-employment is comparatively intensive in base labor. The intercept of the  $W_I$  earnings line is drawn below the intercepts of the earnings lines of the other employment types because, as discussed in Section II, (a) taxes, fees, and other costs associated with incorporation are comparatively high. The  $W_I$  intercept for a particular individual will be higher (or lower) when the person's mixture of cognitive and noncognitive traits are comparatively productive (unproductive) in incorporated self-employment. The intercept of the  $W_U$  earnings line is drawn above the intercepts of the incorporated and salaried earnings lines because, as discussed in the text, the "taxes" associated with owning an unincorporated business are comparatively low. The  $W_U$  intercept for an individual will be correspondingly higher if the person's mixture of cognitive and noncognitive traits are comparatively productive in unincorporated self-employment. For an individual,  $W_J^{p50}$  is the median earnings in employment type  $J$ . Thus, people with different mixtures of cognitive and noncognitive traits will face different earnings options associated with the different employment types, i.e., they will face different intercepts and slopes for the  $W_I$  and  $W_U$  lines.

**CENTRE FOR ECONOMIC PERFORMANCE**  
**Recent Discussion Papers**

1236	Jan-Emmanuel De Neve Ed Diener Louis Tay Cody Xuereb	The Objective Benefits of Subjective Well-Being
1235	Pascal Michaillat Emmanuel Saez	A Model of Aggregate Demand and Unemployment
1234	Jerónimo Carballo, Gianmarco I.P. Ottaviano Christian Volpe Martincus	The Buyer Margins of Firms' Exports
1233	Daniel Fujiwara	A General Method for Valuing Non-Market Goods Using Wellbeing Data: Three-Stage Wellbeing Valuation
1232	Holger Breinlich Gianmarco I. P. Ottaviano Jonathan R. W. Temple	Regional Growth and Regional Decline
1231	Michalis Drouvelis Nattavudh Powdthavee	Are Happier People Less Judgmental of Other People's Selfish Behaviors? Laboratory Evidence from Trust and Gift Exchange Games
1230	Dan Anderberg Helmut Rainer Jonathan Wadsworth Tanya Wilson	Unemployment and Domestic Violence: Theory and Evidence
1229	Hannes Schwandt	Unmet Aspirations as an Explanation for the Age U-Shape in Human Wellbeing
1228	Bénédicte Apouey Andrew E. Clark	Winning Big But Feeling No Better? The Effect of Lottery Prizes on Physical and Mental Health
1227	Alex Gyani Roz Shafran Richard Layard David M Clark	Enhancing Recovery Rates: Lessons from Year One of the English Improving Access to Psychological Therapies Programme
1226	Stephen Gibbons Sandra McNally	The Effects of Resources Across School Phases: A Summary of Recent Evidence

- |      |  |   |
|------|--|---|
| 1225 | Cornelius A. Rietveld<br>David Cesarini<br>Daniel J. Benjamin<br>Philipp D. Koellinger<br>Jan-Emmanuel De Neve<br>Henning Tiemeier<br>Magnus Johannesson<br>Patrik K.E. Magnusson<br>Nancy L. Pedersen<br>Robert F. Krueger<br>Meike Bartels | Molecular Genetics and Subjective Well-Being  |
| 1224 | Peter Arcidiacono<br>Esteban Aucejo<br>Patrick Coate<br>V. Joseph Hotz   | Affirmative Action and University Fit: Evidence from Proposition 209  |
| 1223 | Peter Arcidiacono<br>Esteban Aucejo<br>V. Joseph Hotz  | University Differences in the Graduation of Minorities in STEM Fields: Evidence from California                   |
| 1222 | Paul Dolan<br>Robert Metcalfe  | Neighbors, Knowledge, and Nuggets: Two Natural Field Experiments on the Role of Incentives on Energy Conservation |
| 1221 | Andy Feng<br>Georg Graetz  | A Question of Degree: The Effects of Degree Class on Labor Market Outcomes  |
| 1220 | Esteban Aucejo   | Explaining Cross-Racial Differences in the Educational Gender Gap   |
| 1219 | Peter Arcidiacono<br>Esteban Aucejo<br>Andrew Hussey<br>Kenneth Spenner  | Racial Segregation Patterns in Selective Universities   |
| 1218 | Silvana Tenreyro<br>Gregory Thwaites   | Pushing On a String: US Monetary Policy is Less Powerful in Recessions  |
| 1217 | Gianluca Benigno<br>Luca Fornaro   | The Financial Resource Curse  |
| 1216 | Daron Acemoglu<br>Ufuk Akcigit<br>Nicholas Bloom<br>William R. Kerr  | Innovation, Reallocation and Growth   |
| 1215 | Michael J. Boehm   | Has Job Polarization Squeezed the Middle Class? Evidence from the Allocation of Talents                           |

**The Centre for Economic Performance Publications Unit**

**Tel 020 7955 7673 Fax 020 7404 0612**

**Email [info@cep.lse.ac.uk](mailto:info@cep.lse.ac.uk) Web site <http://cep.lse.ac.uk>**