

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

Ross Levine and Yona Rubinstein\*

December 31, 2014

**Abstract:** We disaggregate the self-employed into incorporated and unincorporated, to distinguish between "entrepreneurs" and other business owners. New incorporated businesses are more concentrated in industries that demand workers with stronger non-routine cognitive skills; and incorporated business owners sort into jobs that demand greater non-routine cognitive abilities. The opposite is true for the unincorporated. The incorporated self-employed have distinct cognitive and noncognitive traits. Besides tending to be white, male, and come from higher-income families, the incorporated—as teenagers—typically scored higher on learning aptitude tests, had greater self-esteem, and engaged in more disruptive, illicit activities. The combination of "smart" and "illicit" tendencies as youths 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.

*JEL Classifications:* Entrepreneurship; Self-employment; Occupational choice; Compensation; Firm organization; Corporate finance; Cognitive and Noncognitive traits

*Keywords:* L26; J24; J3; G32

\* 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). Rubinstein: London School of Economics, CEP, and the CEPR, [y.rubinstein@lse.ac.uk](mailto:y.rubinstein@lse.ac.uk). We thank Gary Becker, Moshe Buchinsky, David De Meza, Stephen Durlauf, Luis Garicano, Naomi Hausman, Erik Hurst, Chinhui Juhn, Ed Lazear, Gustavo Manso, Casey Mulligan, Ignacio Palacios-Huerta, Luis Rayo, Andrei Shleifer, Ivo Welch, and seminar participants at the Asia Bureau of Financial and Economic Research, IDC, London School of Economics, NBER Summer Institute, NYU, Simon Fraser University, University of California-Berkeley, University of Chicago, University College-London, UCLA, and the University of Minnesota for helpful comments. Rubinstein thanks STICERD for financial support.

## I. Introduction

Economists since Adam Smith (1776) have emphasized that entrepreneurs spur improvements in living standards by undertaking innovative, risky investments. For example, in Schumpeterian models of creative destruction (Aghion and Howitt, 1991), entrepreneurs drive economic growth by introducing better goods and services that displace old products.

Yet, a substantial body of research—using data on the self-employed to draw inferences about entrepreneurship—concludes that entrepreneurs do not earn more than their salaried counterparts (e.g., Borjas and Bronars 1989, and Evans and Leighton 1989). 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 those of a salaried worker with the same observed traits.<sup>1</sup> To account for entry into self-employment, therefore, research points to (a) the non-pecuniary benefits, such as being “one’s own boss” (Hurst and Pugsley 2011), (b) the fat right tail of the self-employment earnings distribution, and (c) the “over confidence” of entrepreneurs (Bernardo and Welch 2001; Dawson, et al. 2011; and De Meza and Southey 1996).

Beyond earnings, little is known about who becomes an entrepreneur and what is known is puzzling. In models of the allocation of talent, such as Lucas (1978), Baumol (1990), Murphy et al (1991), and Gennaioli et al. (2013), entrepreneurial abilities shape the productivity of the entire firm. But, what are those abilities? Empirically, we document that business owners and salaried workers have similar education, scores on learning aptitude test, and parents with similar education and income.<sup>2</sup> If the self-employed are a good proxy for “growth-creating innovators,” it is puzzling both that their cognitive and noncognitive traits are similar to those of salaried workers *and* that they earn less.

---

<sup>1</sup> By comparing the returns to private and public equity investments, Moskowitz and Vissing-Jorgensen (2002) find that entrepreneurship fails to yield positive returns.

<sup>2</sup> Bertrand and Schoar (2003), Bloom and Van Reenen (2007), and Malmendier and Tate (2009) examine the impact of middle- and upper-management on firm performance. Our focus is on the traits of business owners.

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 creative individuals who mobilize resources for novel products and ventures, others engage in qualitatively different business activities that deliver routine services. For instance, Evans and Leighton (1989) argue that in the United States many self-employed are one-person retail business owners who did not succeed as salaried workers; they are not “growth-creating innovators.” Gennaioli et al (2013) and La Porta and Shleifer (2008) present evidence from around the world that further emphasizes that many businesses are not engaged in innovative, highly-productive activities.

In this paper, we offer a new proxy for entrepreneurship by disaggregating the self-employed into the incorporated and unincorporated and presenting evidence that the incorporated tend to engage in more quintessentially entrepreneurial activities than the unincorporated. By entrepreneurial activities, we refer to the nonroutine cognitive skills associated with creating, producing, and selling novel products, analyzing markets, risks, and competitors, addressing an assortment of organizational, managerial, and strategic challenges, and convincing capital markets to fund the endeavor. Of course, our proxy is imperfect: not all incorporated business owners engage in such “entrepreneurial” activities and not all entrepreneurs incorporate. Nevertheless, we show that by differentiating between incorporated and unincorporated self-employed, we provide a better proxy for entrepreneurs than using the aggregated group of self-employed.

To support this disaggregation, we present three types of evidence. We first recognize that over several centuries, economies created and honed the two defining legal characteristics of the incorporated business—limited liability and a separate legal identity—with the explicit goal of fostering entrepreneurship (Harris 2000). Limited liability increases the appeal of purchasing equity in higher-risk projects. The separate legal identity of a corporation reduces the likelihood that shocks to individual owners will disrupt the firm’s activities, because it is the corporation that owns property and enters into contracts with workers, suppliers, and clients. Besides these benefits, there are direct costs of incorporation, such as annual fees and the preparation of more elaborate financial

statements, and indirect agency costs associated with the separation of ownership and control.

Therefore, when people start businesses engaged in more routine activities that do not benefit much from limited liability and separate legal identity traits, they are more likely to select the unincorporated business form. From this perspective, the choice of the legal form of the business will reflect the nature of the planned business activity.

Second, empirical evidence suggests that incorporated business owners open businesses and engage in activities that are more “entrepreneurial” than people starting unincorporated businesses. Using the U.S. Department of Labor’s Dictionary of Occupational Titles, we show that the incorporated self-employed and their businesses engage in activities demanding a high degree of nonroutine cognitive skills, such as (a) analytical flexibility, creativity, reasoning, and generalized problem-solving and (b) complex interpersonal communications such as persuading, selling, and managing others. We view these skills as closely aligned with entrepreneurship. In contrast, the unincorporated and their businesses engage in activities that demand a high level of eye, hand, and foot coordination, e.g., landscaping, truck driving, and carpentry. We view these manual skills as less closely aligned with standard conceptions of entrepreneurship.

Third, and unsurprisingly given these first two observations about the different activities of incorporated and incorporated self-employed businesses, we find businesses seldom change their legal form: unincorporated businesses rarely incorporate and incorporated businesses rarely become unincorporated sole proprietorships or partnerships. Although there might be concerns that successful unincorporated businesses eventually incorporate for tax or other reasons, this happens exceedingly infrequently. Rather, the evidence suggests that the choice of creating an incorporated or unincorporated business reflects the planned business activity, not its ex post performance.

Using this proxy, we then ask: who becomes an entrepreneur and does it pay? We use the March Supplements of the Current Population Survey (CPS) and the National Longitudinal Survey of Youth, 1979 (NLSY79). The CPS surveys a larger cross-section of individuals than the NLSY79, but was not designed as a longitudinal study. Since the CPS interviews the same physical location two years in a row, we match individuals across time to create a two-year panel, so that we can

control for individual effects in assessing changes in earnings across employment-types (e.g., incorporated, unincorporated, and salaried). The NLSY79 offers two advantages over the CPS. First, it traces individuals through time from 1979 to the present, so that we can more fully examine sorting across employment types. Second, 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, and the degree to which the individual engages in illicit activities. We then study sorting into the different employment types on these traits.

In terms of who becomes an entrepreneur, we find strong sorting into employment types based on cognitive, noncognitive, and family traits. The incorporated tend to be white, male, 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. 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. Although we are not the first to stress that entrepreneurship involves unique skills, as Lazear (2004, 2005) argues that entrepreneurs must be jacks-of-all-trades to organize production efficiently, we believe that we are the first to elucidate how a particular mixture of cognitive and noncognitive traits explains both entry into entrepreneurship and success as an entrepreneur.

In terms of earnings, 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 57% greater and median residual earnings that are 31% greater than their salaried counterparts. We also find that the median unincorporated individual earns 14% 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 36% 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 a 21% 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 who become unincorporated self-employed during their careers tend to earn less per hour 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.

We also discover that many of the same cognitive and noncognitive traits that explain sorting into incorporated self-employment also account for success as an incorporated business owner, suggesting a link between the expected additional earnings from entrepreneurship and the tendency to become an entrepreneur. People with *both* high AFQT and high illicit scores as youths tend to experience much larger increases in earnings when they become incorporated self-employed business owners than people without that combination of traits. Yet, this combination of “smart and illicit” traits is associated with *smaller* earnings for unincorporated business owners. 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 receive positive or negative remuneration depending on the activity.

The distribution of the residual hourly earnings of the incorporated self-employed has a much fatter right tail than that of salaried workers, suggesting that there is a large option value associated with entrepreneurship. Entrepreneurship offers the possibility of comparably enormous increases in earnings. Although we do not assess the 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 a notably fat right tail, while that of unincorporated has a fat left tail.

It is valuable to clarify that we do not identify an exogenous source of variation in incorporation. 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, their earnings rise when they choose to become business owners.

The paper is organized as follows. Sections II and III analyze the CPS and NLSY79 data, respectively. Section IV evaluates the distributions of hourly earnings and Section VI examines the differential returns to cognitive and noncognitive traits by employment type. Section VII concludes.

## II. Earnings and Characteristics of Different Employment Types: CPS

### *A. Data and summary statistics on labor market outcomes and demographics*

In this subsection, we take a first glance at the sorting of individuals into different employment types—salaried, unincorporated self-employed, and incorporated self-employed—using the March Annual Demographic Survey files of the CPS for the work years 1995 through 2012. We start in 1995 because (a) the measure of incorporation changed following the redesign of the CPS in 1994 (Hipple 2010), (b) the CPS improved its top-coding in work year 1995 by allowing for differences across classes of workers and demographics, and (c) the post-1995 period 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 the 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, indicates whether individuals are incorporated or unincorporated. 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>3</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 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,

---

<sup>3</sup> The core distinction in the survey is between unincorporated businesses, such as sole proprietorships and partnerships, and incorporated businesses. The CPS and NLSY79 provide self-reported classifications based on this coarse distinction. 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.



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.

We also construct a two-year matched panel. The CPS interviews a household for four consecutive months, January through April. The next year, the CPS returns to the same location and interviews the household in that location. In most cases, the second interview involves the same household as the first interview. We follow the guidelines in Madrian and Lefren (2000) for matching CPS households across time. This involves checking the age, race, gender, education, etc. of those interviewed in the same location to make a determination if they are same household.

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.

Compared to the median self-employed individual, the median salaried worker earns more per hour, works about the same number of hours, and has 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 35 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. While about 70 percent of prime age individuals were white during the sample period, whites account for 83 percent of the incorporated self-employed. Similarly, women account for 48 percent of the sample of workers, but only 28 percent of the incorporated. Furthermore, the incorporated self-employed are much more educated than salaried workers—and more still than unincorporated workers. While 33 percent of salaried workers graduated from college, 46 percent of the incorporated self-employed had a college degree. Simply comparing salaried and self-employed workers conceals huge differences across employment types.

*B. Job task requirements—DOT: Data and summary statistics*

We examine the differential skills demanded of the incorporated and unincorporated self-employed by using the U.S. Department of Labor’s Dictionary of Occupational Titles (DOT). The DOT was constructed in 1939 to help employment offices match job seekers with job openings. It provides detailed information on the skills demanded of over 12,000 occupations. The DOT was updated in 1949, 1964, 1977, and 1991, and replaced by the O\*NET in 1998. Given the timing of our study, we use the 1991 DOT, and confirm the results when using the 1977 DOT.

The DOT aggregates information into five skill categories that are relevant for our study of entrepreneurship. For each category, it assigns a value between zero and ten, where higher values signify that the job requires more of the particular skill. The first two skill categories measure the nonroutine cognitive skills demanded by particular jobs.

- **Nonroutine Analytical** indicates the degree to which the task demands analytical flexibility, creativity, reasoning, and generalized problem-solving.
- **Nonroutine Direction, Control, Planning** indicates the degree to which the task demands complex interpersonal communications such as persuading, selling, and managing others.

We view these nonroutine cognitive skill categories as closely aligned with “entrepreneurial” activities, such as creating and commercializing a distinctive product, analyzing risks and market opportunities, coordinating the work of others, addressing an assortment of financial, organizational, and strategic challenges, and convincing others of the value of the endeavor.

The DOT also provides data on three categories of skills that align less directly with entrepreneurship.

- **Nonroutine Manual** measures the degree to which the task demands eye, hand, and foot coordination, which is high in such activities as landscaping, truck driving, carpentry, plumbing, and piloting an airline.
- **Routine Analytical** measures the degree to which the task requires the precise attainment of set standards, such as record-keeping or repetitive customer service (e.g., bank teller);
- **Routine Manual** measures the degree to which the task requires repetitive manual tasks, such as picking or sorting fruit or repetitive assembly.

To link the DOT measures to the CPS data, we use the codes provided by Autor, Levy, and Murnane (2003). In their pioneering study of technological change, Autor, Levy, and Murnane (2003) use the DOT to examine changes in the skill requirements of occupations over time. We use the DOT to examine cross-sectional differences in the skills requirements of the incorporated and unincorporated self-employed and to measure differences in the types of industries that are started as either incorporated or unincorporated businesses.

Table 1 provides summary statistics of the job task requirements across employment types. Panel C reports results on the full CPS sample. Panel D uses the two-year matched panel to provide information on the job task requirements of individuals last year if (1) they are self-employed this year and (2) were salaried last year. We provide information on the job task requirements of their salaried jobs while differentiating by self-employment type this year.

Table 1 illustrates that (1) the incorporated self-employed engage in activities that demand greater nonroutine analytical skills than the unincorporated self-employed and (2) the

unincorporated self-employed engage in jobs that demand far greater manual skills than the incorporated self-employed. As shown in Panel C, the incorporated self-employed both have greater Nonroutine Analytical and larger Nonroutine Direction, Control, and Planning values than the unincorporated. In contrast, the unincorporated have an average value of the Nonroutine Manual index of 1.08, while the incorporated have a value of 0.80. Aggregating the incorporated and unincorporated together blurs differences in their job task requirements.

These differences between those that sort into incorporated and unincorporated self-employment exist before they become business owners. As shown in Panel D, those that become incorporated self-employed were engaged in jobs demanding more nonroutine cognitive skills when they were salaried workers. In contrast, those that sort into unincorporated self-employment were involved in jobs demanding more physical abilities. To the extent that one associates entrepreneurship with nonroutine cognitive activities, the summary statistics suggest that the incorporated self-employed engage (and engaged) in more quintessentially entrepreneurial activities than individuals opening unincorporated businesses.

### *C. Job task requirements—DOT: Multinomial logit regressions*

In Table 2, we use multinomial logit regressions to assess the independent association between employment type and the differential skills demand of individuals in those different employment types while accounting for other individual characteristics. We estimate the probability that a *salaried worker* in year  $t-1$  becomes an incorporated or unincorporated business owner in year  $t$ . We focus on examining the sorting into incorporated and unincorporated self-employment based on the job task requirements of the individual as a salaried worker in year  $t-1$ . The dependent variable is employment type in year  $t$ , where the reported regressions provide estimates on incorporated and unincorporated self-employment, and where salaried employment is the excluded category. As regressors, we include (1) three measures of job task requirements in  $t-1$ : Nonroutine Analytical, Nonroutine Direction, Control, and Planning, and Nonroutine Manual; (2) basic demographic and employment information: the number of years of education, a quartic for

experience, gender and race fixed effects, the number of hours worked in year  $t-1$ ; and (3) state and year fixed effects. We use the two-year matched panel of the CPS for work years 1995 through 2012, and further restrict the sample to individuals who were salaried workers in  $t-1$ .

The incorporated self-employed and their businesses engage in very different activities from other businesses. For example, the estimates in Table 2 provide four clear messages about the sorting into employment types on the job task requirements of previous jobs. First, people who open incorporated businesses were more likely to have been working in salaried jobs that demanded greater nonroutine cognitive abilities than people who remained in salaried jobs. Second, the opposite is true of the unincorporated: people who open unincorporated businesses were less likely to have been working in salaried jobs that demanding strong Nonroutine Analytical abilities than people who remained in salaried jobs. Third, people who open incorporated businesses were less likely to have been working in salaried jobs that required a high degree of Nonroutine Manual skills than people who remained in salaried jobs. Fourth, again, the opposite is true of the unincorporated: people who start unincorporated businesses tended to work in jobs requiring greater Nonroutine Manual skills than those that remained salaried workers.

Table 2 provides additional information on who sorts into employment types. While individuals who worked more hours as salaried workers have a greater probability of becoming incorporated self-employed, the opposite is true for the unincorporated self-employed. Those who work relatively few hours as salaried workers have a higher probability of becoming unincorporated self-employed. Furthermore, consistent with the summary statistics, the multinomial logit regressions indicate that women are less likely to become self-employed, especially incorporated self-employed, and more educated people are more likely to become incorporated self-employed.

#### *D. Do the incorporated and unincorporated open different types of businesses?*

Incorporated businesses are very different from unincorporated ones as measured by the job task requirements of incorporated and unincorporated businesses. To make this assessment, we first construct measures of the job task requirements of each industry. We compute the hours-weighted

required skills demanded of all people working in each industry over the work years 1995 through 2012 for Nonroutine Analytical skills, Nonroutine Direction, Control, and Planning skills, and Nonroutine Manual skills. We then assess whether incorporated businesses tend to be concentrated in industries that demand more nonroutine cognitive abilities from their workers than unincorporated business and whether unincorporated businesses tend to be heavily concentrated in industries demanding more manual skills from its workers.

The results in Table 3 suggest that compared to unincorporated businesses, new incorporated businesses are (1) more concentrated in industries that demand stronger nonroutine cognitive skills from its workers and (2) less concentrated in industries that require strong manual skills from workers. Again, the opposite is true of new unincorporated businesses. In the regressions, the dependent variables are the job task requirements of each industry. The analyses in Table 3 are conducted for the sample of individuals that were salaried workers in year  $t-1$  and are self-employed in year  $t$ . The main regressor is a dummy variable that equals one if the new business is incorporated and zero if the new business is unincorporated. The results show that new incorporated businesses are in industries that require more cognitive skills than new unincorporated businesses.

*E. Positive ex post sorting into incorporated self-employment?*

We address a potential 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. Given our two-year matched panel for the CPS and the extensive longitudinal data in the NLSY79, we can examine transitions between self-employment types. We present these data below for the NLSY79 data, but note here that there is very little switching between self-employment types. Furthermore, all of our results are robust to excluding such

“switchers.” The legal form of the business is overwhelmingly an ex ante choice, and not an ex post choice based on the success of the business.

*F. Residual hourly earnings and different employment types*

We now evaluate the relationship between hourly earnings and employment types. We control for standard demographics (a quartic expression for potential work experience and dummy variables for six education categories), as well as year fixed effects.<sup>4</sup> We present the regression results for the sample of white, prime age (25-55) males, who work full-time. 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 4 presents the results of eight hourly earnings regressions, where Panels A and B present the OLS and median findings respectively. We report the results on two explanatory variables: Incorporated (Unincorporated) equals one if the individual is incorporated (unincorporated) self-employed and zero otherwise. We conduct the OLS analyses on (1) the full sample, (2) the subsample of individuals on which we have a matched two-year panel, (3) the OLS results controlling for individual fixed effects, and (4) when examining the change in an individual’s hourly earnings, where we use the same regressors as in the other specifications. For the median regressions, we provide the same analyses except that we compute the deviation from each person’s median earnings (rather than individual fixed effects). In the OLS regressions, residuals are clustered at the year level. For the median regressions, the findings hold when computing the bootstrapped standard errors of the coefficient estimates based on 500 random samples with replacement.

---

<sup>4</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, pwe<sup>2</sup>, pwe<sup>3</sup>, and pwe<sup>4</sup>, 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.

Table 4 indicates that (1) the median and average incorporated self-employed earns more than his salaried and unincorporated counterparts, and (2) the median and average unincorporated business owner earns less than his counterparts. Before controlling for individual fixed effects, the mean residual hourly earnings of the incorporated are about 35% greater than a comparable salaried worker. In contrast, the mean residual hourly earnings of the unincorporated are about 14% lower than a comparable salaried worker. The median regression results are qualitatively similar, but economically smaller. The median residual hourly earnings of the incorporated self-employed are about 8% greater than comparable salaried workers, while the unincorporated earn about 25% less than a salaried worker with similar Mincerian traits.

These findings account for the literature's puzzling results on self-employment. 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 comparable salaried workers.

We also—by constructing and using the two-year matched CPS sample—evaluate the change in an individual's earnings associated with becoming an incorporated or unincorporated self-employed business owner. Since we only have a two-year panel, the analyses only capture the earnings of new business owner in the first year. To the extent that a business's first year is less successful than subsequent years, these analyses will yield a lower bound on the estimated increase in earnings associated with switching into self-employment. Below, we exploit the longer time-series dimension of the NLSY79.

We discover that individuals that become incorporated business owners tend to experience an increase in their hourly earnings, while individuals that self-sort into unincorporated business ownership tend to experience a large decrease in their hourly earnings. The fixed effect OLS regression indicates that an individual that becomes an incorporated business owners tends to experience an immediate (i.e., from year  $t-1$  to  $t$ ) jump in hourly earnings of about 9% (of the average salaried worker's pay per hour). The opposite is true for the unincorporated self-employed:



Individuals that become unincorporated business owners tend to experience a 17% drop in their hourly earnings. For the incorporated, the estimated effects at the median are smaller, amounting to a two percent increase in earnings in the first year of incorporation.

Our results also indicate that people who become incorporated business owners were earning much more as salaried workers than people with the same Mincerian traits who remain salaried. To see this, compare the regressions with and without fixed effects. The without fixed effect regression indicates that mean residual earnings of an individual are 35.7% greater in the first year after becoming an incorporated business owner relative to a person with similar Mincerian traits that remains salaried. The fixed effects regression indicates that the average residual earnings of an individual are 9.1 percent higher in the year that he becomes incorporated self-employed. The difference between these two estimates indicates that the average person who incorporated in year  $t$  enjoyed residual earnings of about 26.6% ( $=35.7 - 9.1$ ) percent more as a salaried worker in year  $t-1$  than a salaried worker with the same observable traits who did not become an incorporated business owner in year  $t$ . Nevertheless, as shown in the fixed effects analyses, when the average person becomes an incorporated business owner, his earnings tend to rise by about 9% in the first year. Moreover, we find essentially the same coefficient estimates when examining *changes* in residual hourly earnings: When a person becomes incorporated self-employed residual earnings rise.

All of these patterns are essentially the opposite for the unincorporated self-employed. First, they tend to earn less per hour than their salaried counterparts when they were salaried. Second, when they become unincorporated self-employed, their hourly earnings tend to fall still further. Aggregating the incorporated and unincorporated together misses distinguishing information about these two activities.

### *G. Discussion and interpretation*

Distinguishing between the incorporated and unincorporated provides notably 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 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.

### **III. 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 to assess the changes in earnings when an individual 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.

#### *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>5</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, the longitudinal nature

---

<sup>5</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.

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 aggressive, risk taking, disruptive, “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. 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**.

While some might view the Illicit Activity Index as only proxying (inversely) for risk aversion, our analyses caution against this presumption and hence highlight the degree to which the Illicit Activity Index measures the aggressive, disruptive, 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).

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?"

*B. The earning and characteristics of individuals by employment type*

Panels A-B of Table 5 show that the summary statistics from the NLSY79 about labor market outcomes and basic demographics and education are similar to those from the CPS.<sup>6</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 54 percent more per hour and works 26 percent more hours than the median salaried worker. In contrast, while the median unincorporated business owner works about the same number of hours as the median salaried worker, earnings per hour are about 14 percent less. Third, the incorporated self-employed tend to be disproportionately white, male, and highly educated, while the unincorporated tend to be less educated than salaried workers. The incorporated are notably different from the unincorporated self-employed.

Individuals who become incorporated self-employed have distinct family backgrounds (Panel C). 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.

Moreover, individuals who become incorporated self-employed display striking cognitive and noncognitive characteristics along three key dimensions *before* they enter the labor market (Panel D). First, people that become incorporated self-employed had (1) higher "ability" as

---

<sup>6</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.

measured by AFQT values, (2) stronger self-esteem as measured by Rosenberg scores, and (3) a stronger sense of controlling their futures, rather than having their futures determined by fate or luck, as measured by low Rotter Locus of Control scores. Second, 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. Third, 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 almost 40 percent more likely to have been stopped by the police; and, the incorporated self-employed have an overall illicit activity index (standardized for the full sample), which is measured when they were between the ages of 15 and 22, that is 21 percent 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 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) Our findings are also consistent with the work of Horvath and Zuckerman (1993), Zuckerman (1994), and Nicolaou, Shane, Cherkas, and Spector (2008), who argue that personality traits influence sorting into entrepreneurship.

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 F of Table 5 shows that 67% 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 45% 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 5 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.

*C. The skills demanded of incorporated, unincorporated, and salaried individuals*

As with the CPS, we also use the DOT to illustrate the distinctive job task requirements demanded of the incorporated and unincorporated self-employed. Panel E of Table 5 provides information on the skills demanded of individuals when they are salaried, incorporated business owners, and unincorporated business owners and when they were last salaried workers.

The incorporated business owners are—and were—in jobs that demand more nonroutine cognitive skills and less manual skills than the unincorporated self-employed or salaried workers. This holds both for job task requirements of the occupations reported by incorporated, unincorporated, and salaried workers and for the job task requirements of their occupations last year if they were salaried. Incorporated business owners do jobs, and did jobs when they were salaried workers, that demand high-levels of nonroutine cognitive skills, but that do not require high-levels of manual abilities. The opposite is true of those that run unincorporated businesses. Unincorporated business owners report doing jobs that demand a high-level of nonroutine manual skills, but that demand much lower nonroutine cognitive abilities than the incorporated self-employed business owner

*D. Selection on cognitive and noncognitive traits: Multinomial Logit*

We now use multinomial logit regressions to isolate which pre-labor market traits have an independent association with employment choices. Table 6 provides regressions of employment type on measures of cognitive ability (AFQT) and noncognitive traits (the Rotter locus of control indicator, the Rosenberg self-esteem measure, and Illicit). We also include an interaction term for “smart and illicit” (AFQT\*Illicit). The analyses 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 gender, race, 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. The errors are clustered at the individual level.

Several findings emerge. 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 70% less likely to become incorporated business owners 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 10<sup>th</sup> to the 90<sup>th</sup> percentile—is associated with a 40% 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>7</sup>

Third, people that have *both* high AFQT scores *and* high Illicit Activity Index values are much more likely to become incorporated business owners. For example, people with average values of both have an almost 40% greater probability of becoming incorporated than other people after controlling for many characteristics. Furthermore, Table 6 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 disruptive, “break-the-rules” behavior is tightly linked with entrepreneurship.

*E. Selection on labor market productivity: Multinomial Logit*

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 comparative success as a salaried worker and sorting into incorporated and unincorporated self-employment.

To do this, we first compute each individual’s average hourly wages when the person is 25 through 29 years old (Wages 25-29). We then run a new battery of multinomial logit regressions, for people 30 years of age or older, to assess whether productivity as a salaried worker—as measured by Wages 25-29—explains sorting into employment types and reports the results in Table 7. Moreover, and critically, we include the interaction between Wages 25-29 and the Illicit Activity Index to assess whether the mixture of “productive” and illicit characteristics shapes employment decisions. We control for the educational attainment of each individual along with all of the regressors included in Table 6. To focus on a more homogeneous group of individuals, we only examine full-time, full year white males for the remainder of our analyses.

---

<sup>7</sup> Blanchflower and Oswald (1998) find that the probability of self-employment is positively related to whether the individual ever received an inheritance.

Three messages emerge from Table 7. First, as shown by the interaction term, individuals who are both comparatively successful salaried workers when they are young *and* who were highly engaged in disruptive, illicit activities in their youths have a higher propensity to become incorporated self-employed business owners later in life. 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. Second, The Table 7 results indicate negative sorting into unincorporated self-employment on early career wage earnings. We believe this is the first paper to show that comparatively unsuccessful salaried workers are more likely to become unincorporated self-employed. Third, though not the focus of this paper, it is worth noting that family income no longer enters significantly in Table 7, as it did in Table 6. The change in significance arises because of the change in the sample: Table 7 only includes white males. These differential findings are 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.

*F. Traits, employment types, and job task requirements*

We now examine the sorting into different types of business activities by both the legal form of the business and the underlying traits of the business owner. We early showed for the CPS data that incorporated and unincorporated business activities are different: Incorporated businesses tend to be in industries that demand a comparatively high degree of nonroutine cognitive skills from workers and a low degree of manual skills; but unincorporated businesses tend to be in industries that demand a comparatively high degree of nonroutine manual skills from their workers but a relatively low degree of nonroutine cognitive skills.

With the NLSY79, we can extend the CPS analyses of the nature of the business along two dimensions. First, we control for individual fixed effects to more precisely link the legal form of the business with the nature of the business as defined by the job task requirements of the industry. Second, we split the sample into individuals with above and below average values of the smart and

illicit interaction term (AFQT\*Illicit). This links the supply of traits—as measured by this smart and illicit measure—with the demand for skills by particular self-employment types—as measured by the job task requirements of people working within industries.

Table 8 provides six regressions, where the dependent variable is a measure of the job task requirements of the industry in which the individual works. To measure the job task requirements of an industry, we again use the hours weighted measure of three categories of skills demanded by workers in each industry as in the CPS analyses. The three categories are Nonroutine Analytical, Nonroutine Direction, Control, and Planning, and Nonroutine Manual. The sample is restricted to individuals who were salaried last year, so we examine people who remain salaried and those that switch into incorporated or unincorporated self-employment. We present the estimated coefficients on (a) a dummy variable that equals one if the person is an incorporated business owner and zero otherwise and a corresponding dummy variable for unincorporated self-employment. The regressions also control for individual fixed effects, as well year and year of birth fixed effects, and a quartic in experience. For each category of industry job task requirements, we present results for those with above and below the mean values of the smart and illicit interaction term.<sup>8</sup> To work with a more homogeneous group, we restrict the sample to white males.

We find that it is important to differentiate the underlying cognitive and noncognitive traits of the business owner when assessing the nature of incorporated businesses. First, when individuals with above average values of the AFQT\*Illicit interaction term open incorporated businesses, they tend to be in industries the demand a high degree of noncognitive skills from their workers. However, when individuals with below average values of the “smart and illicit” interaction term become incorporated business owners, they are not disproportionately centered in industries demand a high degree of nonroutine cognitive abilities from their workers. When “smart and illicit” individuals become incorporated business owners, they disproportionately do so in industries that demand a high degree of cognitive skills from their workers. Second, it is less important to

---

<sup>8</sup> We use above and below zero since the standardized mean value of AFQT is 50 and that of Illicit is zero for the full NLSY79 sample.

distinguish between the underlying traits of unincorporated business owners in accounting for the job task requirements of their businesses. When individuals become unincorporated business owners, they tend to be in industries a high degree of manual skills from their workers—not a high degree of cognitive skills—and this holds regardless of whether the unincorporated business owners have above or below the mean values of the AFQT\*Illicit index.

*G. Transitions across employment types with NLSY79 sample*

As discussed above, one potential concern is that successful businesses incorporate ex post. That is, perhaps people experiment as unincorporated business and only become incorporated business owners if the enterprise is successful. Such ex post sorting into different legal forms would not account for (a) the different requirements of the occupations of people who become incorporated and unincorporated self-employed or (b) the different cognitive and noncognitive traits of people that become incorporated or unincorporated business owners. Nevertheless, there might be concerns about such ex post sorting when considering earnings.

As shown in Figures 1a and 1b, however, very few people switch the legal forms of their businesses. As also documented for the CPS data, very few people switch from unincorporated to incorporated self-employment, or vice-versa. The data are consistent with the view that people choose the legal form of their businesses ex ante based on which legal best suits the nature of the planned activities of the business.

#### **IV. Mincerian Returns to Entrepreneurship**

*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 Table 9, we examine both hourly earnings and the change in hourly earnings. For the change in hourly earnings, the differencing is done between years  $t$  and  $t-2$  because of NLSY79 sampling frequency. In addition, we provide results with 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), and cognitive and noncognitive traits (AFQT, Rosenberg Self-Esteem, Rotter Locus of Control, and Illicit Activity Index). In the first difference specifications, we report the results on the change in employment status between period  $t-2$  and  $t$ . Thus, for these specifications, "Incorporated" can equal -1, 0, or 1 if the individual switched out of incorporated self-employment, was not incorporated self-employed in period  $t$  or  $t-2$ , or switched into incorporated self-employment. For these difference regressions, "Unincorporated" is defined similarly. In the difference regressions, we control for the same regressors as in the level analyses. The sample includes full-time, full-year white, male workers who are at least 25 years old.

Table 9 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 (1) and (2). Regression (1) indicates that the average residual earnings of the incorporated are about 57 percent greater than salaried workers. Regression (2) indicates that the average residual earnings of an individual are 21 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 36 percent more as a salaried worker than a salaried worker with the same observable traits, but who never incorporates. It is crucial to account for individual effects when comparing earnings across different employment types.

Second, when an individual becomes incorporated, his residual hourly earnings tend to rise markedly. On average, residual earnings rise 21 percent higher after a person becomes incorporated. Evaluated at the median (regression 5), the difference is 6.3 percent. Moreover, we find very similar coefficient estimates when examining *changes* in residual hourly earnings (regressions 3 and 6). When a person becomes incorporated self-employed residual earnings rise. 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 an increase in residual hourly earnings.<sup>9</sup>

Third, the patterns are quite different for the unincorporated self-employed. On average, a person's hourly residual earnings do not change much when the person becomes an unincorporated business owner. When evaluated at the median, analyses suggest both negative sorting into unincorporated self-employment and a drop in median hourly earnings. Comparing regressions 4 and 5 illustrates (1) individuals who at some point in their careers become unincorporated self-employed business owners tend to have 13.9 percent lower median hourly earnings as salaried workers than comparable salaried workers, and (2) they experience a further drop of 2.5 percent in median hourly earnings when they make the switch to self-employment. These results are robust to several concerns.<sup>10</sup>

---

<sup>9</sup> We also examined whether 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. We addressed this in two ways. First, we included an individual effect in regression (3), where the dependent variable is the change in hourly earnings. The estimated coefficient on Incorporated with the individual effect (3.5) is insignificantly different from that reported in regression (3). Second, we allowed for individual trends (in addition to individual fixed effects) in regression (2), where the dependent variable is hourly earnings. The estimated coefficient on Incorporated when accounting for individual trends is not significantly different from that reported in Table 9. These robustness results confirm that there is a positive break in an individual's earning profile associated with switching from salaried work into incorporated self-employment.

<sup>10</sup> 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.

### B. *Selection on realizations*

Next we shed light on the future path of earnings after a person first becomes a business owner, regardless of whether the person remains self-employed. So far we controlled for selection on time invariant factors. Yet, we did not account for the option to return to paid employment when self-employment pays less than expected. To address this issue, the self-sorting on realizations, we estimate the change in earnings since the first entry into self-employment regardless of whether he returns to salaried employment. Specifically we flag the time-period since first entry into self-employment with two indicators (i) Ever Incorporated, which equals one since the year that a person becomes incorporated, and (ii) Ever Unincorporated, which equals one since the year that a person becomes unincorporated. In this way, we assess (1) whether a person's future earnings rise after he first becomes self-employed, regardless of whether he returns to salaried employment and (2) whether earnings are higher when a person is a self-employed business owner while controlling for whether he has ever been a business owner.

The results presented in Table 10 indicate the following. First, after an individual incorporates, his future hourly earnings rise, on average and at the median, regardless of whether he returns to salaried employment (see first entry, columns ii and vii). Second, when a person is an incorporated business owner, his earnings per hour are greater than when he was salaried even conditioning on whether he was ever a business owner in the past (see third entry, columns iv and viii). Third, when a person returns to salaried employment after being an incorporated business owner, his future hourly earnings are greater, on average, than they were before he became an incorporated business owner (see first entry columns iv). The results indicate that individuals that experiment with entrepreneurship and then return to salaried jobs do no worse in the year that they return to salaried employment than they were doing before initiating the incorporated business. An individual's average and median residual hourly earnings as a salaried worker do not fall after trying an entrepreneurial endeavor (see first entry, columns iv and viii).

The Table 10 results on unincorporated self-employment offer a stark contrast. After an individual becomes an unincorporated self-employed, his future hourly earnings fall regardless of

whether he returns to salaried employment. Second, when conditioning on whether a person was ever a business owner in the past, we find that the unincorporated business owner's average earnings per hour are greater than when he was salaried. Third, when a person returns to salaried employment after being an unincorporated business owner, his hourly salaried earnings are smaller than they were before moving to unincorporated self-employment (see second entry, columns iv and viii).

### *C. Annual vs. hourly earnings*

Given the literature's emphasis on the autonomy and flexibility of self-employment (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 annual earnings, annual hours worked and employment type.

Results are found in Tables 11. The self-employed tend to work many more hours than salaried workers (approximately 18%). Much of that (half) reflects person effects; when including individual effects, the incorporated self-employed works almost an addition 200 hour per year on average than when he was salaried (8%). These patterns hold for unincorporated individuals, who also, on average, work more than they did as salaried employees. Hence, self-employment involves a material jump in "effort," as measured by hours worked. This is well reflected in their annual earnings. Self-employed, incorporated and unincorporated, earn more when we allow for labor supply effects. These results hold on average and at the median, while controlling or not controlling for individual effects.

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

In this section, we address three 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?

*A. Differential Returns to Traits by Employment Type*

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 analysis also provides information whether the same skills account for earnings differences across different employment types?

Table 12 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 above, we split the sample between individuals with above and below average values of the “smart and illicit” interaction term (AFQT\*Illicit) and between individuals with above and below the average value of the “productive and illicit” interaction term (Wages 25-29\*Illicit). For the analyses based on splitting the sample according to Wages 25-29, we examine people 30 years of age or above.

We find that the same key traits associated with selection into incorporated self-employment also account for the magnitude of the increase in earnings associated with becoming an entrepreneur. The results presented in Table 12 indicate that the positive association between a change in earnings and a switch into incorporated self-employment exists especially for highly ability individuals (as measured by either high AFQT or high Wages 25-29) who also exhibit a greater tendency to break the rules as youths (as measured by high values of the Illicit index). Some of the same traits associated with sorting into incorporated self-employment—smart and illicit traits—also explain comparative earnings among entrepreneurs. 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. An individual's mixtures of skills matter in accounting for compensation in different employment activities.

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>11</sup> Our work demonstrates that a special mixture of cognitive and noncognitive skills—the combination of outstanding abilities and disruptive tendencies—is strongly associated with entrepreneurial success.

#### *B. Distribution of Hourly Earnings by Employment Type, 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. Thus, for example, we compare the residual hourly earnings of the incorporated self-employed at the 70<sup>th</sup>-percentile of the hourly earnings distribution of the incorporated with the residual hourly earnings of a salaried worker at the 70<sup>th</sup>-percentil of the hourly earnings distribution of salaried workers. For each decile, the figures report two bars: (i) residual hourly earnings and (ii) deviations of residual hourly earnings from a person's median hourly residual earnings, where residual earnings are obtained from a wage regression that controls for education (six categories),

---

<sup>11</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.

potential experience (quartic), AFQT, Rosenberg self-esteem, 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 (90<sup>th</sup>-percentile of the residual hourly earnings distribution of the incorporated self-employed) tends to enjoy a 70 percent boost in hourly earnings relative to his own hourly earnings as an exceptionally successful salaried worker (90<sup>th</sup>-percentile of the residual hourly earnings distribution of salaried workers). And, a person that is exceptionally unsuccessful when he incorporates (10<sup>th</sup>-percentile of the residual hourly earnings distribution of the incorporated) tends to suffer an almost 60 percent drop in hourly earnings relative to his own hourly earnings as an exceptionally unsuccessful salaried employee (10<sup>th</sup>-percentile of the residual hourly earnings distribution of salaried workers). Figure 2a is consistent with the view that entrepreneurship, at the median, pays—and it offers the possibility of comparably enormous returns. When focusing on the unincorporated self-employed in Figure 2b, 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. Furthermore, the distribution for the unincorporated is skewed toward negative earnings relative to salaried wages. Thus, 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.

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 showed earlier 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. Conclusions

We disaggregate the self-employed into incorporated and unincorporated business owners to distinguish between “entrepreneurs” and other business owners. We show that incorporated business owners tend to engage in jobs that demand more nonroutine cognitive skills than either unincorporated business owners or salaried workers. In contrast, unincorporated business owners tend to perform tasks that demand more nonroutine manual skills than the incorporated self-employed. To the extent that one associates entrepreneurship more with analytical reasoning, creativity, and complex interpersonal communications such as persuading and coordinating rather than with eye, hand, and foot coordination, the data suggest that incorporated self-employment are more engaged in entrepreneurial activities than the unincorporated.

We discover that the incorporated self-employed 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 male, white, 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. 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 earlier puzzles 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.

We also show that 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.

## References

- Aghion, Philippe, and Peter Howitt. 2009. *The Economics of Growth*. Cambridge, MA: MIT Press.
- Alchian, Armen A., and Harold Demsetz. 1972. Production, information costs and economic organization. *American Economic Review* 62: 777-795.
- 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 (4): 1279-1333
- Baumol, William. 1990. Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy* 98(5): 893-921.
- Bernardo, Antonio E., and Ivo Welch. 2001. On the evolution of overconfidence and entrepreneurs. *Journal of Economics & Management Strategy* 10 (3): 301-330.
- Bertrand, Marianne, and Antoinette Schoar. 2003. Managing with style: the effect of managers on firm policies. *Quarterly Journal of Economics* 118(4): 1169-1208.
- Blanchflower, David G., and Andrew J. Oswald. 1998. What makes an entrepreneur? *Journal of Labor Economics* 16 (1): 26-60.
- Blau, David M. 1985. A time-series analysis of self-employment in the United States. *Journal of Political Economy* 95 (June): 445-67.
- Bloom, Nicholas, and John Van Reenen. 2007. Measuring and explaining management practices across firms and countries. *Quarterly Journal of Economics* 122(4): 1351-1408.
- Borjas, George J. 1987. Self-selection and the earnings of immigrants. *American Economic Review* 77(44): 531-553.
- Borjas, George J., Stephen G. Bronars. 1989. Consumer discrimination and self-employment. *Journal of Political Economy* 97 (June): 581-605.
- Bowles, S., H. Gintis, and M. Osborne. 2001. The determinants of earnings: A behavioral approach. *Journal of Economic Literature* 39 (4): 1137-1176.
- Cooper, Arnold C., Carolyn Y. Woo, and William C. Dunkelberg. 1988. Entrepreneurs' Perceived changes for success. *Journal of Business Venturing* 3 (Spring): 97-108.
- Dawson, Christopher, David de Meza, Andrew Henley, and G. Reza Arabsheibani. 2011. Entrepreneurship, cause or consequence of financial optimism. LSE mimeo.
- De Meza, David, and C. Southey. 1996. The borrower's curse: Optimism, finance, and entrepreneurship. *Economic Journal* 106: 375-386.

- 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.
- Evans, David S., and Boyan Jovanovic. 1989. An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy* 97 (4): 808-27.
- Evans, David S., and Linda S. Leighton. 1989. Some empirical aspects of entrepreneurship. *American Economic Review* 79 (June): 519-35.
- Fairlie, Robert W. 2005. Self-employment, entrepreneurship, and the NLSY79. *Monthly Labor Review* 128 (February): 40-47.
- 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.
- Fama, Eugene. 1980. Agency problems and the theory of the firm. *Journal of Political Economy* 88: 288-307.
- Garicano, Luis, and Esteban Rossi-Hansberg. 2006. Organization and inequality in a knowledge economy. *Quarterly Journal of Economics* (November): 1383-1435.
- Glaeser, Edward L. 2007. Entrepreneurship and the city. NBER Working Paper 13551.
- Gennaioli, Nicola, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2013. Human capital and regional development. *Quarterly Journal of Economics* 128: 105-164.
- Griliches, Zvi. 1977. Estimating the returns to schooling: Some econometric problems. *Econometrica* 45(1): 1-22.
- Gronau, Reuben. 1974. Wage comparisons—a selectivity bias. *Journal of Political Economy* 82(6): 1119-1143.
- Hall, Robert, and Susan Woodward. 2010. The burden of the nondiversifiable risk of entrepreneurship. *American Economic Review* 100 (3): 1163-1194.
- Hamilton, Barton H. 2000. Does entrepreneurship pay? An empirical analysis of the returns to self-employment. *Journal of Political Economy* 108 (3): 604-631.
- Harris, Ron. 2000. *Industrializing English Law: Entrepreneurship and Business Organization, 1720-1844*. New York: Cambridge University Press.
- 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.

- Heckman, James J. 1974. Shadow prices, market wages, and labor supply. *Econometrica* 42(4): 679–694.
- Heckman, James J., 2000. Policies to foster human capital. *Research in Economics*, Elsevier, vol. 54(1): 3-56.
- Heckman, James J., and Yona Rubinstein. The importance of noncognitive skills: Lessons from the GED testing program. *American Economic Review* 91(May): 145-149.
- 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.
- Hipple, Steven F. 2010. Self-employment in the United States. *Monthly Labor Review* 113 (November): 17-32.
- 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.
- Horvath, Paula, and Marvin Zuckerman. 1993. Sensation seeking, risk appraisal, and risky behavior. *Personality and Individual Differences* 14 (January): 41-52.
- 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.
- 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.
- Hurst, Erik, and Benjamin W. Pugsley. 2011. What do small businesses do? *Brookings Papers on Economic Activity* (Fall 2011): 73-118.
- Jovanovic, Boyan. 1979. Job matching and the theory of turnover. *Journal of Political Economy* 87 (5): 972.
- 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.
- 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.
- King, Robert, and Ross Levine. 1993. Finance, entrepreneurship, and growth: Theory and evidence. *Journal of Monetary Economics* 32: 513-542.



- Kushner, David. 2012. Machine Politics: The Man Who Started the Hacker Wars. *The New Yorker*, May 7.
- La Porta, Rafael and Andrei Shleifer. 2008. The unofficial economy and economic development. *Brookings Papers on Economic Activity*, 275-352.
- Lazear, Edward P. 2005. Entrepreneurship. *Journal of Labor Economics* 23 (4): 649-680.
- Lazear, Edward P. 2004. Balanced skills and entrepreneurship. *American Economic Review*, 94(2): 208-211.
- Lerner, Josh, Ann Leamon, and Felda Hardymon. 2012. *Venture Capital, Private Equity, and the Financing of Entrepreneurship*. New York: Wiley.
- Lucas, Robert E. 1978. On the size distribution of business firms. *The Bell Journal of Economics* 9(2): 508-523.
- Madrian, Bridgette C., and Lars John Lefgren. 2000. An approach to longitudinally matching Current Population Survey (CPS) respondents. *Journal of Economic and Social Measurement* 26(1): 31-62.
- Malmendier, Ulrike, and Geoffrey Tate. 2009. Superstar CEOs. *Quarterly Journal of Economics* 124(4): 1593-1638.
- Manso, Gustavo. 2013. Experimentation and the returns to entrepreneurship. University of California, Berkeley, mimeo.
- Moskowitz, Tobias, and Annette Vissing-Jorgensen. 2002. The returns to entrepreneurial investment: A private equity premium puzzle? *American Economic Review* 92 (4): 745-778.
- Mulligan Casey, B. and Yona Rubinstein. 2008. Selection, investment, and women's relative wages. *Quarterly Journal of Economics* 123(3): 1061-1110.
- 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.
- 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.
- Romer, Paul M. 1990. Endogenous technological change. *Journal of Political Economy* 98: S71-102.
- Rosen, Sherwin. 1981. The economics of superstars. *American Economic Review* 71 (December): 845-58.

- Roy, Andrew D. 1951. Some thoughts on the distribution of earnings. *Oxford Economic Papers* 3: 135-146.
- Shleifer, Andrei and Robert W. Vishny. 1997. A survey of corporate governance. *Journal of Finance* 52(2): 737-83.
- Smith, Adam. 1776. *An Inquiry into the Nature and Causes of the Wealth of Nations*. London: Methuen and Co.
- Vereshchagnina, Galina, and Hugo Hopenhayn. 2009. Risk taking by entrepreneurs. *American Economic Review* 99 (5): 1808-30.
- Welch, Ivo. 2011. *Corporate Finance*. New York: Prentice-Hall.
- Willis, Robert J., and Sherwin Rosen. 1979. Education and self-selection. *Journal of Political Economy* 87 (5): 7-39.
- 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**

	<hr/>		<hr/>		
	All	Salaried	All	Uninc.	Inc.
Observations	1,225,886	1,108,591	117,295	75,476	41,819
	100.0%	90.4%	9.6%	6.2%	3.4%
<b>A. Labor Market Outcomes</b>					
Mean Earnings	\$47,515	\$46,421	\$58,174	\$40,820	\$89,169
Median Earnings	\$36,090	\$36,363	\$34,190	\$24,625	\$55,591
Median Hourly Earnings	\$18.0	\$18.0	\$17.4	\$13.8	\$24.6
Annual Hours	1985	1976	2078	1936	2331
Full-Time, Full-Year	0.69	0.70	0.64	0.57	0.78
<b>B. Demographics</b>					
Age	40.2	40.0	42.9	42.4	43.6
White	0.70	0.69	0.79	0.76	0.83
Female	0.48	0.49	0.36	0.40	0.28
Years of Schooling	13.7	13.7	13.9	13.6	14.5
College Graduate or More	0.33	0.33	0.36	0.31	0.46
<b>C. Job Task Requirements</b>					
Nonroutine Analytical	3.91	3.87	4.27	3.93	4.89
Nonroutine Direction, Control, Planning	3.00	2.92	3.87	3.19	5.10
Nonroutine Manual	0.99	0.99	0.98	1.08	0.80
<b>D. Job Task Requirements Last Year (if salaried)</b>					
Nonroutine Analytical	4.04	4.01	4.15	3.79	4.66
Nonroutine Direction, Control, Planning	3.15	3.11	3.46	2.79	4.41
Nonroutine Manual	0.95	0.96	0.97	1.10	0.78

Notes: The table presents summary statistics from the March Annual Demographic Survey files of the Census Bureau's CPS for the work years 1995 through 2012, 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. For Panels C and D, we use data on job task requirements from Autor, Levy, and Murnane (2003), who link data from the Dictionary of Occupational Titles with the occupational categories in the CPS. Nonroutine Analytical measures the degree to which the task demands analytical flexibility, creativity, and generalized problem-solving, including tasks such as forming and testing hypotheses, making medical diagnoses, etc. Nonroutine Direction, Control, Planning measures the degree to which the task demands complex interpersonal communications such as persuading, selling, and managing others. Nonroutine Manual measures the degree to which the task demands eye, hand, and foot coordination, including landscaping, truck driving, carpentry, plumbing, and piloting a commercial airline. For panel D, we only include individuals who (a) are part of the matched CPS sample, in which we create a two-year panel for the subset of individuals that we can successfully match following the guidelines in Madrian and Lefren (2000) and (b) were salaried workers in year t-1.

---

---

**Table 2: Selection into Unincorporated and Incorporated Self-Employment, CPS**

	Unincorporated	Incorporated
<b><i>Job Task Requirements Last Year:</i></b>		
Nonroutine Analytical	-0.038** (0.019)	0.055*** (0.017)
Nonroutine Direction, Control, Planning	-0.001 (0.006)	0.039*** (0.008)
Nonroutine Manual	0.037** (0.018)	-0.139*** (0.031)
<b><i>Demographics:</i></b>		
Years of Schooling	0.011 (0.012)	0.055*** (0.012)
Annual Hours Worked Last Year	-0.998*** (0.077)	0.418*** (0.109)
Female	-0.366*** (0.049)	-0.734*** (0.048)
Observations	230,330	230,330
Pseudo R-squared	0.99	0.99

Notes: This table reports multinomial logit estimates of the probability that a worker between the ages of 25 and 55 is unincorporated or incorporated self-employed. Salaried workers are the excluded category. The regressions also include state, year, and race fixed effects, as well as a quartic for experience. The sample excludes persons who do not work either as salaried or self-employed, people living within group quarters, with missing data on relevant demographics, with allocated earnings, and those working in agriculture or the military. The analyses includes the sub-sample of CPS observations for which we have a matched, two-year panel over the work years 1995 through 2012. Data on job task requirements are from Autor, Levy, and Murnane (2003), who link data from the Dictionary of Occupational Titles with the occupational categories in the CPS. Nonroutine Analytical measures the degree to which the task demands analytical flexibility, creativity, and generalized problem-solving, including tasks such as forming and testing hypotheses, making medical diagnoses, etc. Nonroutine Direction, Control, Planning measures the degree to which the task demands complex interpersonal communications such as persuading, selling, and managing others. Nonroutine Manual measures the degree to which the task demands eye, hand, and foot coordination, including landscaping, truck driving, carpentry, plumbing, and piloting a commercial airline. Heteroskedasticity robust standard errors clustered at the year-level are in parentheses, where \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels respectively.

**Table 3: Differences in Task Requirements of New Incorporated and Unincorporated Businesses, CPS**

	<b>The Task Requirements of the Industry of the New Business:</b>		
	Nonroutine Analytical Industry	Nonroutine Direction, Control, Planning Industry	Nonroutine Manual Industry
	(1)	(2)	(3)
New Incorporated Self-Employed Business	0.078** (0.031)	0.129** (0.057)	-0.193*** (0.034)
Observations	2778	2778	2778
R-square	0.003	0.004	0.015

Notes: This table reports regressions of the task requirements of the industries of the businesses of newly self-employed individuals, differentiating between new incorporated and new unincorporated self-employed. Starting from the sub-sample of CPS observations for which we have a matched, two-year panel over the work years from 1995 through 2012, this table further restricts the sample to (a) individuals who were full-time, full-year salaried workers in year t-1 and who became self-employed in year t, and (b) individuals between the ages of 25 and 55, white males, excluding people living within group quarters, with missing data on relevant demographics, with allocated earnings, and those working in agriculture or the military. Data on job task requirements are from Autor, Levy, and Nurnane (2003), who link data from the Dictionary of Occupational Titles with the occupational categories in the CPS. For each industry, we compute the hours-weighted required skills demanded of all people working in the industry over the period from work years 1995 through 2012 for each of three categories of skills: (1) Nonroutine Analytical measures the degree to which the task demands analytical flexibility, creativity, and generalized problem-solving, including tasks such as forming and testing hypotheses, making medical diagnoses, etc.; (2) Nonroutine Direction, Control, Planning measures the degree to which the task demands complex interpersonal communications such as persuading, selling, and managing others; and (3) Nonroutine Manual measures the degree to which the task demands eye, hand, and foot coordination, including landscaping, truck driving, carpentry, plumbing, and piloting a commercial airline. Heteroskedasticity robust standard errors clustered at the year-level are in parentheses, where \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels respectively.

**TABLE 4: Mean and Median Hourly Earnings by Employment Type, CPS**

<b>Panel A: OLS Regressions</b>	<b>Full Sample</b>	<b>Panel Sample (Without Fixed Effects)</b>	<b>Panel Sample (Fixed Effects)</b>	<b>Panel Sample (Differenced)</b>
Incorporated	10.165*** (0.468)	10.284*** (0.759)	2.630*** (0.761)	2.440** (0.930)
Unincorporated	-4.176*** (0.398)	-4.070*** (0.466)	-4.914*** (1.066)	-5.130*** (1.068)
<i>% Difference from Mean Salaried Worker</i>				
Incorporated	35.3%	35.7%	9.1%	8.5%
Unincorporated	-14.5%	-14.1%	-17.1%	-17.8%
Observations	351,746	144,930	144,930	72,465
R-square	0.164	0.163	0.767	0.003
<b>Panel B: Median Regressions</b>	<b>Full Sample</b>	<b>Panel Sample (Without Fixed Effects)</b>	<b>Panel Sample (Deviation from person median)</b>	<b>Panel Sample (Differenced)</b>
Incorporated	1.930*** (0.105)	2.087*** (0.166)	0.500*** (0.086)	0.662*** (0.145)
Unincorporated	-6.337*** (0.103)	-5.974*** (0.170)	-3.895*** (0.097)	-4.063*** (0.160)
<i>% Difference from Median Salaried Worker</i>				
Incorporated	8.3%	9.0%	2.1%	2.8%
Unincorporated	-27.2%	-25.7%	-16.7%	-17.5%
Observations	351,746	144,930	144,930	72,465
Pseudo R2	0.1148	0.1152	0.0018	0.0030

Panels A and B provide the estimated coefficients from OLS and median regressions respectively on two dummy variables: Incorporated equals one if the person is incorporated self-employed and zero otherwise; Unincorporated equals one if the person is unincorporated self-employed and zero otherwise. The regressions control for year and state fixed effects as well as standard Mincerian characteristics: dummy variables for six education categories and a quartic expression for potential work experience. The Full Sample includes white, males, who are full-time workers between the ages of 25 and 55, and excludes persons who do not work either as salaried or self-employed, people living within group quarters, with missing data on relevant demographics, with allocated earnings, and those working in agriculture or the military. The Panel Sample includes the sub-sample of CPS observations for which we have a matched, two-year panel. The Fixed Effects regression includes individual effects, while the Differenced regressions present regressions of the change in hourly earnings on changes in employment type, while controlling for Mincerian characteristics and year fixed effects. For the median regressions, we also examine deviations from the person median. Heteroskedasticity robust standard errors clustered at the year-level are in parentheses, where \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels respectively.

---



**Table 5: Summary Statistics of Salaried and Self-Employed Workers, NLSY79**

	All	Salaried	Self-Employed		
			All	Uninc.	Inc.
Observations	126,727 100.0%	116,585 92.0%	10,142 8.0%	8,392 6.6%	1,750 1.4%
<b>A. Labor Market Outcomes</b>					
Mean Earnings	\$44,025	\$42,916	\$55,282	\$45,579	\$92,797
Median Earnings	\$35,022	\$35,029	\$34,030	\$28,795	\$61,409
Median Hourly Earnings	\$17.1	\$17.1	\$16.8	\$14.7	\$26.3
Annual Hours	1963	1950	2087	1993	2459
Full-Time, Full-Year	0.64	0.64	0.57	0.52	0.75
<b>B. Demographics</b>					
Age	35.4	35.2	37.1	36.6	38.9
White	0.81	0.80	0.87	0.86	0.90
Female	0.47	0.48	0.39	0.41	0.28
Years of Schooling	13.8	13.8	13.6	13.4	14.2
College Graduate or More	0.29	0.30	0.26	0.23	0.36
<b>C. Family background</b>					
Mother's Education	11.7	11.7	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	0.76	0.83
Family Income in 1979	\$59,856	\$59,498	\$63,385	\$60,119	\$76,909
<b>D. Cognitive and non-cognitive traits</b>					
AFQT	51.4	51.4	51.9	50.9	55.6
Rotter Locus of Control (standardized)	-0.10	-0.09	-0.19	-0.16	-0.28
Rosenberg Self-Esteem (standardized)	0.08	0.08	0.11	0.07	0.27
Illicit Activity Index (standardized)	0.01	0.00	0.12	0.10	0.21
Force (raw)	0.04	0.04	0.06	0.06	0.08
Steal 50 or less (raw)	0.21	0.21	0.24	0.23	0.26
Stopped by Police (raw)	0.19	0.18	0.22	0.21	0.25

**E. Job Task Requirements**

Nonroutine Analytical	3.72	3.72	3.63	3.41	4.50
Nonroutine Direction, Control, Planning	2.71	2.67	3.10	2.79	4.34
Nonroutine Manual	1.05	1.03	1.19	1.25	0.96

***Last Year Salaried***

Nonroutine Analytical	3.71	3.72	3.68	3.51	4.30
Nonroutine Direction, Control, Planning	2.65	2.64	2.66	2.39	3.68
Nonroutine Manual	1.05	1.04	1.18	1.24	0.96

**F. Self-designation and invention (2010)**

Entrepreneur	0.20	0.17	0.50	0.45	0.67
Entrepreneur (standardized)	0.00	-0.08	0.75	0.64	1.19
Applied for Patent	0.00	0.00	0.01	0.00	0.03
Applied for Patent (standardized)	0.00	-0.01	0.07	0.01	0.29

---

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 work years 1982 through 2012. Family background and data on cognitive and non-cognitive traits are measured in 1979 and in 1980, which is before anyone in the 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. Two Parents Family (14) equals one if the person at the age of 14 had two parents living at home 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 disruptive, 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 6: 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><i>Cognitive and Non-cognitive Traits</i></b>						
AFQT*Illicit	-0.017 (0.095)	-0.016 (0.095)	-0.124 (0.105)	-0.129 (0.106)	0.400** (0.162)	0.384** (0.165)
Illicit	0.088* (0.046)	0.061 (0.047)	0.120** (0.049)	0.090* (0.050)	-0.062 (0.098)	-0.057 (0.100)
AFQT	-0.286** (0.124)	0.069 (0.141)	-0.309** (0.132)	0.166 (0.151)	-0.228 (0.267)	-0.414 (0.294)
Rosenberg Score	0.016 (0.030)	0.031 (0.030)	-0.018 (0.032)	0.001 (0.032)	0.191*** (0.061)	0.182*** (0.061)
Rotter Score	-0.086*** (0.028)	-0.093*** (0.028)	-0.079*** (0.030)	-0.087*** (0.030)	-0.122** (0.057)	-0.125** (0.057)
<b><i>Demographics and Family Income</i></b>						
Black	-0.654*** (0.076)	-0.560*** (0.078)	-0.621*** (0.079)	-0.493*** (0.081)	-0.897*** (0.172)	-0.960*** (0.176)
Hispanic	-0.269*** (0.083)	-0.210** (0.083)	-0.325*** (0.087)	-0.244*** (0.087)	-0.019 (0.180)	-0.054 (0.186)
Female	-0.339*** (0.055)	-0.316*** (0.056)	-0.266*** (0.059)	-0.236*** (0.060)	-0.701*** (0.120)	-0.720*** (0.121)
Family income in 1979 (in 100K)	0.034 (0.089)	0.069 (0.090)	-0.083 (0.100)	-0.040 (0.101)	0.425*** (0.165)	0.425*** (0.165)
<b><i>Controlling for education</i></b>	No	Yes	No	Yes	No	Yes
Observations	119915	119915	119915	119915	119915	119915

Note: This table reports multinomial logit estimates of the probability that an individual, 25 years of age or older, is self-employed, incorporated self-employed, or unincorporated self-employed, where salaried employment is the excluded category. All dummy variables are defined exclusively. AFQT is a measure of cognitive ability, which ranges from 1 to 100, and is divided by 100 in these analyses. The Illicit Index, which was computed in 1980, measures the degree to which an individual engaged in an array of aggressive, risk-taking, and disruptive activities. It is standardized to equal zero for the NLSY79 population. 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. Family Income in 1979 is the income of the person's family in 1979, divided by \$100,000. Though unreported in the table, all regressions control for year of birth, the year of the survey, a dummy variable of whether both parents were living at the home of the individual at the age of 14, 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 numbered regressions also include educational attainment (six categories) and a quartic for potential experience. We exclude observations in which the person is neither salaried nor self-employed and observations with missing demographics (gender, race and ethnicity, schooling) or missing values for AFQT, Rosenberg Self-Esteem, Rotter Locus of Control, and Illicit. Reported standard errors (in parentheses) are corrected for heteroskedasticity and clustered by individual. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

**Table 7: Selection into Employment Types on Cognitive, Noncognitive, and Family Traits,**

<i>Self-Employment by Type:</i>	<b>Self-Employed</b>	<b>Unincorporated</b>	<b>Incorporated</b>
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
<b><i>Cognitive and Non-cognitive Traits</i></b>			
Wages 25-29*Illicit	0.146 (0.093)	0.073 (0.100)	0.365** (0.169)
Illicit	-0.294 (0.226)	-0.132 (0.241)	-0.820* (0.435)
Wages 25-29	-0.472*** (0.140)	-0.670*** (0.149)	0.217 (0.274)
Rosenberg Score	0.019 (0.060)	-0.033 (0.068)	0.174* (0.094)
Rotter Score	-0.119** (0.055)	-0.134** (0.062)	-0.077 (0.095)
<b><i>Demographics and Family Income</i></b>			
Family income in 1979 (in 100K)	0.116 (0.164)	-0.013 (0.199)	0.381 (0.245)
Constant	4.083 (3.128)	4.565 (3.401)	0.909 (5.947)
Observations	21414	21414	21414

Note: This table reports multinomial logit estimates of the probability that an individual, 30 years of age or older, is self-employed, incorporated self-employed, or unincorporated self-employed, where salaried employment is the excluded category. All dummy variables are defined exclusively. Wage 25-29 is the average hourly wage of the individual while he is 25-29 years old. The Illicit Index, which was computed in 1980, measures the degree to which an individual engaged in an array of aggressive, risk-taking, and disruptive activities. It is standardized to equal zero for the NLSY79 population. 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. Family Income in 1979 is the income of the person's family in 1979, divided by \$100,000. Though unreported in the table, all regressions control for year of birth, the year of the survey, a dummy variable of whether both parents were living at the home of the individual at the age of 14, educational attainment (six categories), a quartic for potential experience 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). We exclude observations in which the person is neither salaried nor self-employed and observations with missing demographics (gender, race and ethnicity, schooling) or missing values for AFQT, Rosenberg Self-Esteem, Rotter Locus of Control, and Illicit. These regressions only include white (nonhispanic) males. Reported standard errors (in parentheses) are corrected for heteroskedasticity and clustered by individual. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

**Table 8: Differences in Task Requirements of Businesses by Individual Traits, NLSY79**

	The Task Requirements of the Industry of the New Business					
	Nonroutine Analytical Industry		Nonroutine Direction, Control, Planning Industry		Nonroutine Manual Industry	
Incorporated	0.071 (0.072)	0.127** (0.062)	0.025 (0.119)	0.199** (0.096)	0.062 (0.081)	-0.028 (0.054)
Unincorporated	-0.076* (0.044)	-0.013 (0.040)	-0.213*** (0.069)	-0.188*** (0.048)	0.201*** (0.036)	0.191*** (0.035)
Individual fixed effects and other controls	Yes	Yes	Yes	Yes	Yes	Yes
Sample	AFQT*Illicit ≤ 0	AFQT*Illicit > 0	AFQT*Illicit ≤ 0	AFQT*Illicit > 0	AFQT*Illicit ≤ 0	AFQT*Illicit > 0
Observations	15392	14096	15392	14096	15392	14096
R-square	0.616	0.551	0.588	0.520	0.635	0.567

Notes: This table reports regressions of the task requirements of the industries of salaried workers and businesses of newly self-employed individuals, differentiating between (1) new incorporated and new unincorporated businesses and (2) individuals with above and below the average values of the smart and illicit interaction term (AFQT\*Illicit). The sample includes prime age white males, who were salaried workers in year t-1. Data on job task requirements are from Autor, Levy, and Murnane (2003), who link data on the Dictionary of Occupational Titles with occupational categories. For each industry, we compute the hours-weighted skills demanded from people working in the industry over the sample period for each of three categories of skills: (1) Nonroutine Analytical measures the degree to which the task demands analytical flexibility, creativity, and generalized problem-solving, including tasks such as forming and testing hypotheses, making medical diagnoses, etc.; (2) Nonroutine Direction, Control, Planning measures the degree to which the task demands complex interpersonal communications such as persuading, selling, and managing others; and (3) Nonroutine Manual measures the degree to which the task demands eye, hand, and foot coordination, including landscaping, truck driving, carpentry, plumbing, and piloting a commercial airline. The regressions control for individual effects, a quartic in experience, and year fixed effects. Heteroskedasticity robust standard errors clustered at the year-level are in parentheses, where \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels respectively.

**Table 9: Hourly Earnings and Individual Effects, NLSY79**

	Mean			Median		
	Hourly Earnings (1)	Hourly Earnings (2)	Δ Hourly Earnings (3)	Hourly Earnings (4)	Hourly Earnings (5)	Δ Hourly Earnings (6)
Incorporated	13.898*** (2.242)	5.100*** (1.505)	4.435** (1.933)	6.167*** (0.508)	1.269*** (0.254)	0.985*** (0.337)
Unincorporated	0.651 (1.020)	0.927 (0.663)	-0.090 (0.743)	-2.814*** (0.326)	-0.511*** (0.163)	-0.765*** (0.233)
<i>% Difference from salaried workers</i>						
Incorporated	57.4	21.0	18.3	31.0	6.3	4.9
Unincorporated	2.7	3.8	-0.4	-13.9	-2.5	-3.8
Individual effects	No	Yes	No	No	Yes	No
Sample age	25+	25+	27+	25+	25+	27+
Observations	22617	22617	18784	22617	22617	18784

Note: This table reports OLS and quantile regressions for white males working full-time, full-year. The dependent variable in regressions (1), (2), and (4) hourly earnings; the dependent variable in regressions (3) and (6) is the change over two year in hourly earnings; and, the dependent variable in regression (5) is the difference between hourly earnings and the individual's median earnings a full-time, full-year worker. All dummy variables are defined exclusively. Thus, in the regressions in which the dependent variable is Hourly Earnings, Incorporated equals one in the years that a person is incorporated self-employed and zero otherwise, Unincorporated equals one in the years that a person is unincorporated and zero otherwise. Salaried workers are the excluded category. In the regressions in which the dependent variable is the Change in Hourly Earnings: the dummy variable Incorporated equals one if a person is incorporated this year but was not incorporated two years ago, and equals negative one if the person is not incorporated this year but was incorporated self-employed two years ago, and equals zero if the person did not change into or out of incorporated self-employment; and the dummy variable for Unincorporated is defined similarly. All specifications control for standard Mincerian characteristics—dummy variables for six education categories and a quartic expression for potential work experience—and cognitive and noncognitive traits: AFQT, Rosenberg Self-Esteem, Rotter Locus of Control, and the Illicit Activity Index. The sample mean and median hourly earnings of salaried workers are 24.2 and 20.3 respectively, so the values for the “% difference from salaried workers” are computed relative to these statistics. Standard errors are in parentheses. In the OLS regressions, the reported standard errors are clustered at the individual level and corrected for heteroskedasticity. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

**Table 10: Hourly Earnings After Being Self-Employed, NLSY79**

Variables of Interest	OLS/Mean				Median			
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Ever Incorporated	9.422*** (1.856)	4.301*** (0.707)	4.606** (2.332)	2.412*** (0.908)	3.888*** (0.362)	0.579*** (0.177)	1.701*** (0.514)	-0.046 (0.249)
Ever Unincorporated	-2.755*** (0.769)	-2.370*** (0.521)	-4.457*** (0.887)	-3.420*** (0.591)	-3.554*** (0.225)	-0.569*** (0.110)	-3.722*** (0.295)	-0.621*** (0.143)
Incorporated			10.299*** (2.795)	3.726*** (0.893)			6.244*** (0.714)	1.433*** (0.346)
Unincorporated			4.188*** (1.206)	2.351*** (0.555)			0.511 (0.421)	0.064 (0.204)
<i>% Difference from salaried workers</i>								
Ever Incorporated	39%	18%	19%	10%	19%	3%	8%	0%
Ever Unincorporated	-11%	-10%	-18%	-14%	-18%	-3%	-15%	-3%
Incorporated			43%	15%			26%	6%
Unincorporated			17%	10%			2%	0%
Individual Effects	No	Yes	No	Yes	No	No	Yes	Yes
Observations	22617	22617	22617	22617	22617	22617	22617	22617

Note: This table reports OLS and median regressions for white males working full-time, full-year. The dependent variable is either hourly earnings or annual earnings as indicated in the column headings. The explanatory variable, Ever Incorporated, equals zero until an individual first becomes incorporated self-employed and then equals one thereafter. Ever Unincorporated equals zero until an individual first becomes unincorporated self-employed and then equals one thereafter. Thus, for some individuals after some point in their lives, Ever Unincorporated and Ever Incorporated both equal one. For the OLS regressions that use individual effects, the table provides the results from a standard fixed effect regression. For the median regressions using individual effects, the table reports median regressions in which hourly and annual earnings are computed relative to the median values for the individual. All specifications control for standard Mincerian characteristics—dummy variables for six education categories and a quartic expression for potential work experience—and cognitive and noncognitive traits: AFQT, Rosenberg Self-Esteem, Rotter Locus of Control, and the Illicit Activity Index. The sample mean and median hourly earnings of salaried workers are 24.2 and 20.2 respectively, so the values for the “% difference from salaried workers” are computed relative to these statistics. Standard errors are in parentheses. In the OLS regressions, the reported standard errors are clustered at the individual level and corrected for heteroskedasticity. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

**Table 11: Annual Worked Hours and Earnings, NLSY79**

	OLS/Mean				Median			
			Annual Hours				Annual Hours	
<b>Panel A: Annual Worked Hours</b>								
Incorporated	--	--	430*** (52)	168*** (29)	--	--	412*** (27)	70*** (11)
Unincorporated	--	--	397*** (36)	186*** (24)	--	--	372*** (17)	141*** (7)
<i>% Difference from salaried workers</i>								
Incorporated			17%	7%			18%	3%
Unincorporated			16%	8%			16%	6%
<b>Panel B: Earnings</b>								
	Hourly Earnings		Annual Earnings		Hourly Earnings		Annual Earnings	
Incorporated	13.898*** (2.242)	5.100*** (1.505)	47903*** (6537)	19620*** (4149)	6.167*** (0.508)	1.269*** (0.254)	25087*** (1254)	4827*** (629)
Unincorporated	0.651 (1.020)	0.927 (0.663)	9556*** (2859)	5928*** (1797)	-2.814*** (0.326)	-0.511*** (0.163)	-134 (805)	1403*** (404)
<i>% Difference from salaried workers</i>								
Incorporated	57%	21%	81%	33%	31%	6%	52%	10%
Unincorporated	3%	4%	16%	10%	-14%	-3%	0%	3%
Individual Effects	No	Yes	No	Yes	No	Yes	No	Yes
Observations	22617	22617	22617	22617	22617	22617	22617	22617

Note: This table reports OLS and median regressions for white males working full-time, full-year aged 25-55. The dependent variable in panel (A) is annual worked hours and either hourly earnings or annual earnings as indicated in the column headings and in panel (B). For the OLS regressions that use individual effects, the table provides the results from a standard fixed effect regression. For the median regressions using individual effects, the table reports median regressions in which hourly and annual earnings are computed relative to the median values for the individual. All specifications control for standard Mincerian characteristics—dummy variables for six education categories and a quartic expression for potential work experience—and cognitive and noncognitive traits: AFQT, Rosenberg Self-Esteem, Rotter Locus of Control, and the Illicit Activity Index. The sample mean and median annual worked hours of salaried workers are 2,416 and 2,316 respectively, and the mean and median annual earnings of salaried workers are 59,237 and 48,270 respectively, so the values for the “% difference from salaried workers” are computed relative to these statistics. Standard errors are in parentheses. In the OLS regressions, the reported standard errors are clustered at the individual level and corrected for heteroskedasticity. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.



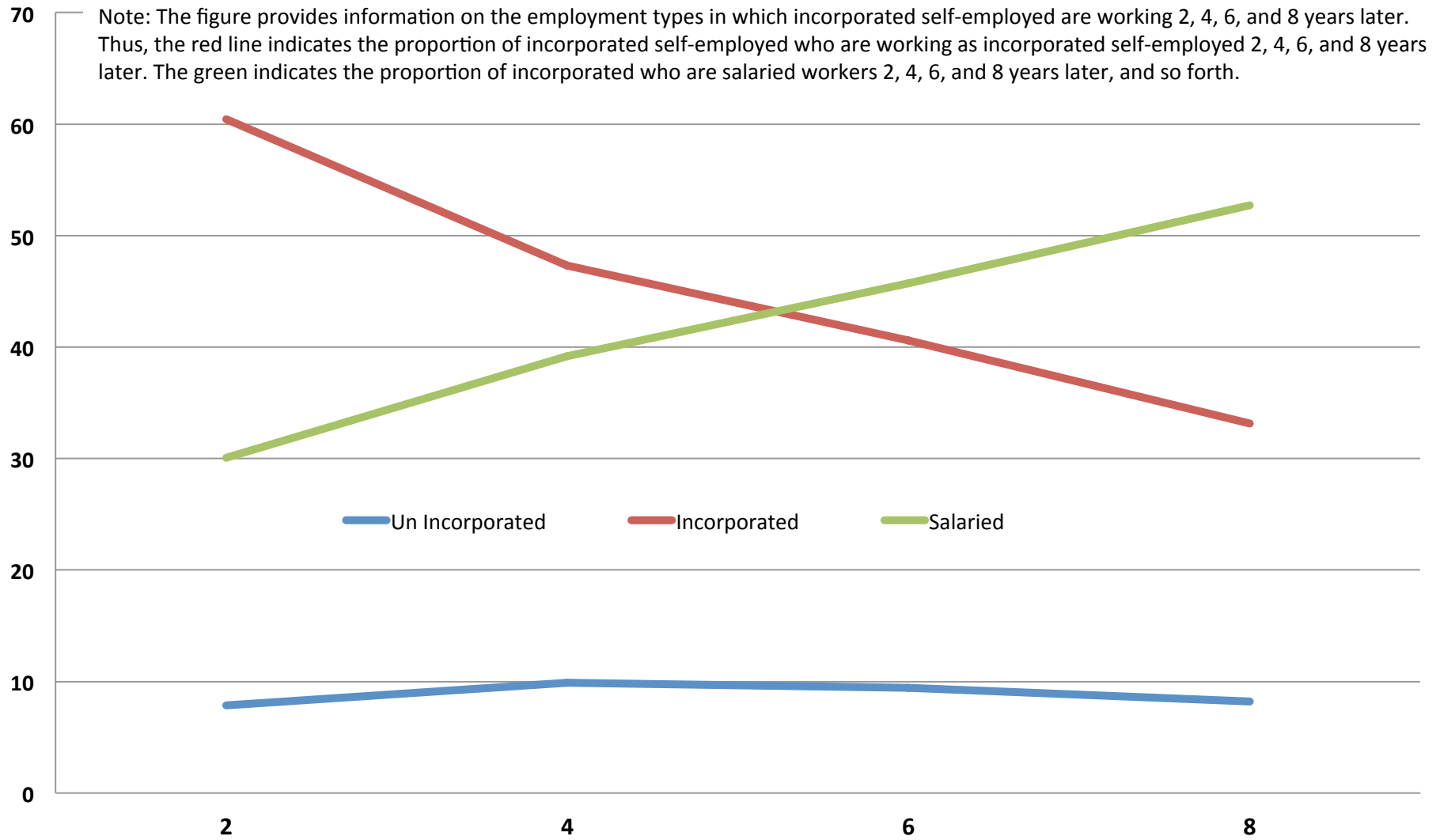
**Table 12: Differential Returns by "Smart and Illicit", Medians, NLSY79**

Dependent Variable: The Change in Hourly Earnings

Variable of Interest	By AFQT and Illicit		By Hourly Wage and Illicit	
	$\leq 0$ (i)	$> 0$ (ii)	$\leq 0$ (iii)	$> 0$ (iv)
$\Delta$ Incorporated	-0.629 (0.502)	1.720*** (0.493)	-0.988 (0.622)	1.391** (0.592)
$\Delta$ Unincorporated	-0.801** (0.312)	-1.328*** (0.391)	-0.709* (0.395)	-1.316*** (0.482)
Median hourly earnings of salaried workers	21.818	21.650	23.597	23.216
<i>% Difference from salaried workers</i>				
Incorporated	-3%	8%	-4%	6%
Unincorporated	-4%	-6%	-3%	-6%
Observations	9548	7591	7426	5519

Note: This table reports median regressions for white males working full-time, full-year aged 30-55. The dependent variable is the change in hourly earnings between the earnings today and two years ago. The main explanatory variables are the change in the incorporated and the unincorporated status during the past two years. All specifications control for the type of employment two years ago and experience. Standard errors are in parentheses. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

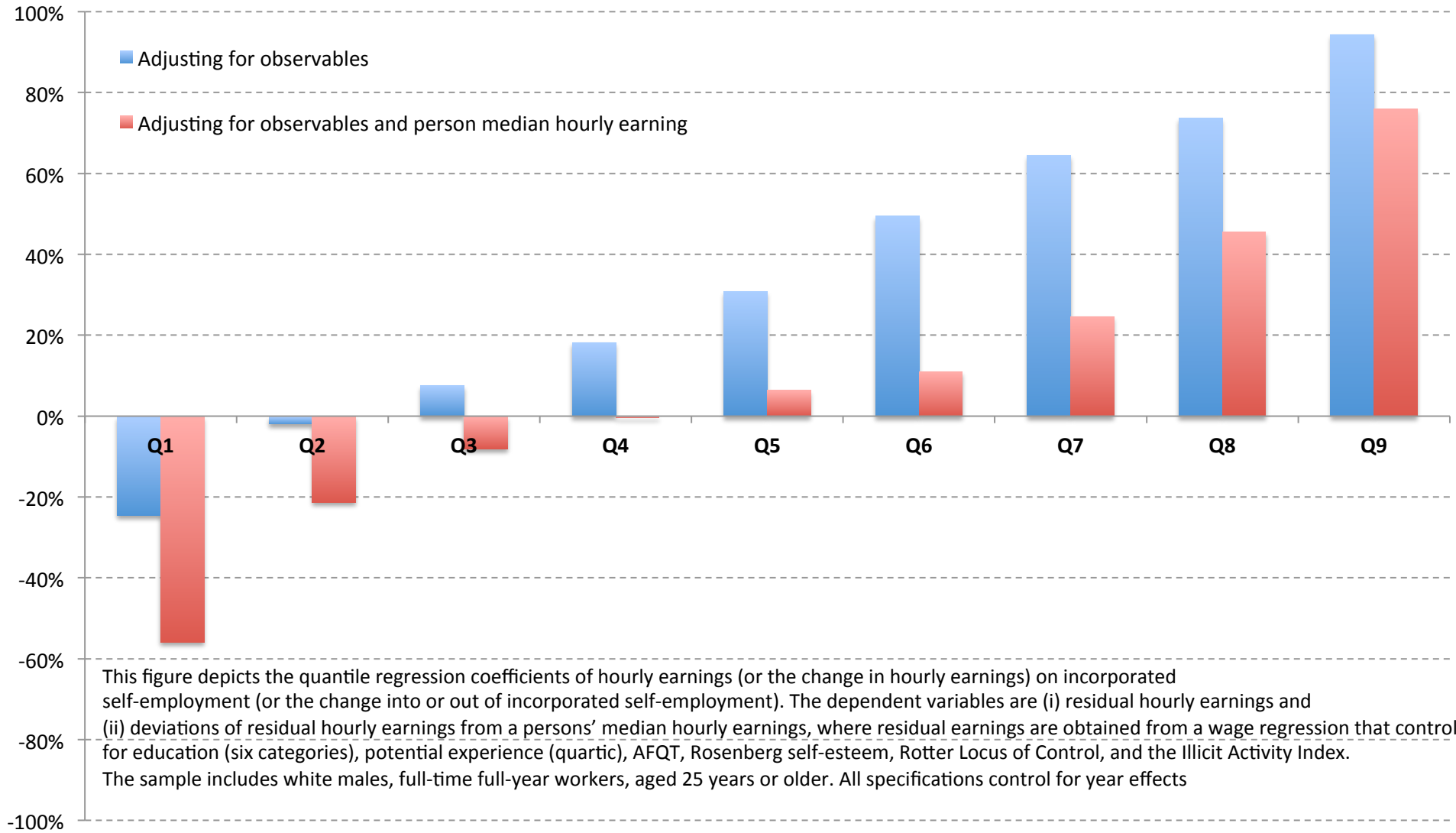
**Figure 1a: Incorporated Workers 2, 4, 6 and 8 Years Later**



**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**

