

NBER WORKING PAPER SERIES

SMART AND ILLICIT:  
WHO BECOMES AN ENTREPRENEUR AND DO THEY EARN MORE?

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Working Paper 19276  
<http://www.nber.org/papers/w19276>

NATIONAL BUREAU OF ECONOMIC RESEARCH  
1050 Massachusetts Avenue  
Cambridge, MA 02138  
August 2013

Previously circulated as "Smart and Illicit: Who Becomes an Entrepreneur and Does it Pay?" 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, Steffen Pischke, Luis Rayo, Andrei Shleifer, Chris Stanton, John Sutton, Ivo Welch, Noam Yuchtman, and seminar participants at the American Economic Association meetings, 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, University of Minnesota, and Victoria University of Wellington for helpful comments. Rubinstein thanks STICERD for financial support. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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Smart and Illicit: Who Becomes an Entrepreneur and Do They Earn More?

Ross Levine and Yona Rubinstein

NBER Working Paper No. 19276

August 2013, Revised March 2015

JEL No. G32,J24,J3,L26

**ABSTRACT**

We disaggregate the self-employed into incorporated and unincorporated to distinguish between "entrepreneurs" and other business owners. We show that the incorporated self-employed and their businesses engage in activities that demand comparatively strong nonroutine cognitive abilities, while the unincorporated and their firms perform tasks demanding relatively strong manual skills. 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 past research, we find that entrepreneurs earn much more per hour than their salaried and unincorporated counterparts.

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## I. Introduction

Economists since Adam Smith (1776) have emphasized that entrepreneurs spur improvements in living standards. For example, Schumpeter (1911) argued that entrepreneurs drive economic growth by creating and introducing new goods, services, and production processes that displace old businesses. For Schumpeter (1911), entrepreneurs are “disruptive” economic leaders who break from routine by introducing novel products. For Lucas (1978), Baumol (1990), Murphy, Shleifer, and Vishny (1991), and Gennaioli et al. (2013), entrepreneurs are pivotal figures, and the allocation of their skills shapes the productivity of firms and entire economies.

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), Evans and Leighton (1989), and Moskowitz and Vissing-Jorgensen (2002)). 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. 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, as stressed by Bernardo and Welch (2001) and De Meza and Southey (1996).

Beyond earnings, little is known about who becomes an entrepreneur and what is known is puzzling. Schumpeter (1911), Knight (1921), Lucas (1978), Baumol (1990), Murphy, Shleifer, and Vishny (1991), and Gennaioli et al. (2013) emphasize the unique skills of entrepreneurs in shaping innovation and growth. Yet, as we document below, the average self-employed business owner and salaried worker have similar education levels, learning aptitude scores, and family backgrounds. If the self-employed are a good proxy for “growth-creating entrepreneurs,” it is puzzling that their cognitive and noncognitive traits are similar to those of salaried workers *and* that they earn less.

Perhaps, self-employment is not a good proxy for entrepreneurship. Glaeser (2007) argues that self-employment aggregates together different types of activities and individuals, making “little distinction between Michael Bloomberg and a hot dog vendor.” While some of the self-employed

are creative economic leaders who mobilize resources for distinctive 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. Gennaioli et al (2013) and La Porta and Shleifer (2008) present evidence from around the world showing that many of the self-employed run low-productivity, commonplace businesses; they are not Schumpeterian entrepreneurs engaged in the nonroutine processes of creating, producing, and marketing novel products. Thus, studying the self-employed in general might yield misguided inferences about entrepreneurs in particular.

In light of these concerns about the overlap between the conception and measurement of entrepreneurship, we offer a new empirical proxy for entrepreneurship. We disaggregate the self-employed into the incorporated and unincorporated and present evidence that on average (1) the incorporated engage in the types of entrepreneurial activities emphasized by Schumpeter, while the unincorporated do not and (2) the incorporated open different types of businesses from those owned by the unincorporated self-employed. In particular, we use the U.S. Department of Labor's Dictionary of Occupational Titles to document 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 the Schumpeterian conception of entrepreneurship. In contrast, we find that unincorporated business owners engage in activities, and open businesses, that demand notably low-levels of these cognitive skills and instead demand high-levels of eye, hand, and foot coordination, e.g., landscaping, truck driving, and carpentry. Strong manual skills are not defining features of the Schumpeterian conception of entrepreneurship.

This sorting of business owners engaged in nonroutine, innovative activities into the incorporated business form rather than into the unincorporated business form is consistent with the history and legal characteristics of corporations. Over several centuries, people 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, not the individual owners. Not all businesses, however, will choose to incorporate. 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 or having a separate legal identity, they are more likely to select the unincorporated business form; and, when people start businesses engaged in more novel, innovative, and risky endeavors—for which limited liability and the separate legal identity were created—they are more likely to select the incorporated business form. From this perspective, the choice of the legal form of the business reflects the nature of the planned business activity.

Consistent with this view, we find that 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. For example, four years after firms start as unincorporated businesses, less than four percent switch their legal form and become incorporated businesses. 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 our proxy of entrepreneurship, we then ask: who becomes an entrepreneur and do they earn more? We use the March Supplements of the Current Population Survey (CPS) and the National Longitudinal Survey of Youth, 1979 (NLSY79). Although the CPS was not designed as a longitudinal study, we match individuals across time to create a two-year panel. This allows us to control for individual effects in assessing the change in earnings associated with a person who switches into or out of entrepreneurship. Although the NLSY79 surveys fewer individuals than the

CPS, it has two advantages. First, it traces individuals from when they were teenagers or young adults in 1979 through 2012. Second, the NLSY79 has information on cognitive and noncognitive traits before individuals become prime age workers, including data on learning aptitude, personality traits, and the degree to which the individual engages in illicit activities. This provides insights on who becomes an entrepreneur—and who succeeds as one.

We find strong sorting into employment types based on cognitive and noncognitive traits. The incorporated tend to be white, male, more educated, and more likely to come from high-earning, well-educated, two-parent families than salaried workers. Even as teenagers, those who incorporate later in life tend to score higher on learning aptitude tests, exhibit greater self-esteem, and engage in more illicit activities than other people. The unincorporated are very different. Although those who become unincorporated business owners also tend to engage in more illicit activities as youths than salaried workers, the unincorporated do not score higher on learning aptitude tests.

Moreover, it is a particular *mixture* of pre-labor market traits that is most powerfully associated with entrepreneurship. First, people who *both* engage in illicit activities as teenagers *and* score highly on learning aptitude tests have a much greater tendency to become incorporated self-employed business owners than others. It is the particular mixture of “smart” *and* “illicit” characteristics that accounts for sorting into incorporated self-employment. Second, we also examine the connection between the pre-labor traits of the entrepreneur and the nature of the business that he owns later in life. Not only do the smart and illicit have a higher propensity to own incorporated businesses than people with other pre-labor market traits, we also show that they run different businesses.

These findings on the self-sorting of individuals into different employment types based on pre-labor market traits further highlight the usefulness of disaggregating the self-employed into incorporated and unincorporated business owners. People with smart and illicit traits as youths who later run incorporated businesses are more likely to run businesses in industries demanding workers with high levels of creative thinking, analytically advanced problem solving, and communication skills. But, people with smart and illicit traits as youths who instead run unincorporated businesses

are not more likely to run firms in industries that demand such strong analytical skills from their workers. Thus, even among “smart and illicit” people, the choice of the legal form of the business provides information about the nature of the business.

We next examine earnings. As noted above, considerable research examines the differential earnings associated with individuals self-sorting between salaried work and self-employment. This research indicates that the median self-employed person earns less than a comparable salaried worker. We contribute to this literature by assessing what happens to an individual’s earnings when self-sorting among salaried work, incorporated self-employment, and unincorporated self-employment. We examine what happens to earnings when a person chooses to become either an incorporated or unincorporated business owner.

We find that the incorporated self-employed earn much more per hour and work many more hours than the salaried and unincorporated. After conditioning on standard Mincerian characteristics, the incorporated self-employed have average residual hourly earnings that are 53% greater and median residual earnings that are 26% greater than their salaried counterparts. We also find that the median unincorporated individual earns 13% 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 who incorporate at some point in their lives earn about 35% more on average as salaried workers than comparable salaried workers who never incorporate: some people have traits associated with both higher earnings, regardless of employment type, and a greater tendency to incorporate. Nevertheless, when controlling for individual effects, individual-trend effects, and many additional robustness tests, workers enjoy an 18% boost in average residual hourly earnings when switching from salaried to incorporated self-employment. Thus, this is the first paper to show that entrepreneurs tend (1) to be successful

salaried workers before becoming incorporated self-employed and (2) to enjoy an additional boost in earnings when they become entrepreneurs. It is a small group of successful salaried workers with a particular constellation of cognitive and noncognitive traits who 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 who never become self-employed. While there is positive sorting on salaried earnings into incorporated self-employment, it is the comparably unsuccessful salaried workers who sort into unincorporated self-employment. Thus, taken together with the earlier results on the change in earnings, our analyses indicate that (1) comparatively low-earning salaried workers tend to become unincorporated business owners and (2) these individuals then experience a drop in hourly earnings. Recently, Hurst, Li, and Pugsley (2014) show that the self-employed tend to underreport their earnings, which might account for some of the drop in reported hourly earnings when people shift to unincorporated self-employment.

Our findings also contribute to the study of entrepreneurship by differentiating between hourly and annual earnings. We find that people who become self-employed—both incorporated and unincorporated business owners—earn more per annum than they were earning as salaried workers. As emphasized above, the incorporated earn more per hour and work more hours. But, the results on the unincorporated highlight that the self-employed apparently have a valuable option to work longer hours. Although hourly earnings of the median person who switches from salaried employment to unincorporated self-employment tend to fall by 2%, annual earnings tend to rise by 2% because the person works more hours.

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 remainder of the paper is organized as following. Section II presents that data and summary statistics. Section III relates the Schumpeterian conception of entrepreneurship to the different tasks performed by incorporated and unincorporated business owners and their employees. In Section IV, we study who become an entrepreneur, and we turn to the question of whether entrepreneurs earn more in Section V. Section VI concludes.

## **II. Data and Summary Statistics Across Employment Types**

We use three sets of data to (1) assess whether the incorporated self-employed perform activities—and run businesses—that fit the Schumpeterian conception of entrepreneurship while the unincorporated self-employed perform tasks and open businesses that are qualitatively different, (2) examine the sorting of individuals based cognitive and noncognitive traits into different employment types—as measured by salaried, unincorporated self-employed, and incorporated self-employed types—and different business activities—as measured by routine and nonroutine activities, and (3) evaluate earnings following the self-sorting of people into employment types.

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

We use 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 - 55 years old) who do not: live within group quarters, have missing data on relevant demographics, or work in agriculture or the military.

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>1</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, 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. The next year, the CPS returns to the same 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.

Panel A of Table 1 provides summary statistics from the CPS on 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

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<sup>1</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.

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 Ale 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 and have similar levels of education 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. For example, women account for 48 percent of the sample of workers, but only 28 percent of the incorporated self-employed. As another example, while 33 percent of salaried workers graduate from college, 46 percent of the incorporated self-employed have a college degree. Simply comparing salaried and self-employed workers conceals huge differences across employment types.

*B. NLSY79: Data and summary statistics on labor market outcomes and demographics*

The NLSY79 is a representative survey of 12,686 individuals who were 15-22 years old when they were first surveyed in 1979.<sup>2</sup> Individuals were surveyed annually through 1994 and have since been surveyed biennially. We use survey years 1979 through 2012. Since nobody in our sample is above the age of 55, the NLSY79 sample corresponds to that of the CPS analyses.<sup>3</sup> The NLSY79 survey is conducted every other year starting in 1994.

Although the NLSY79 surveys a smaller cross section of people than the CPS, it has two advantages. First, the NLSY79 is an extensive panel that traces individuals from when they were 15-22 years old through until the age of 48-55. Thus, we follow virtually the entire career path of individuals. This means that we can assess the association between earnings and whether a person has ever been self-employed, which the limited panel nature of the CPS does not permit. Second, the NLSY79 provides detailed information about the cognitive and noncognitive traits of individuals *before* they become prime age workers. Thus, we can examine how the traits of individuals when they were teenagers account for career choices later in life. We wait to describe these unique traits when we focus our examination on the sorting of individuals into different employment types based on these pre-labor market traits.

As shown in Table 1, the summary statistics from the NLSY79 and CPS provide very similar messages about labor market outcomes and basic demographics across employment types.<sup>4</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 about 50 percent more per hour and works about 25 percent more hours than the median salaried worker. In contrast, while the median

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<sup>2</sup> We use the cross-sectional sample (6,111 individuals), the supplemental samples (5,295 individuals), and the military sample (1,280 individuals).

<sup>3</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.

<sup>4</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.

unincorporated business owner works about the same number of hours as the median salaried worker, earnings per hour are about 15 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. Hurst, Li, and Pugsley (2014) show that the self-employed underreport their incomes. This might account for some of the lower median reported earnings of the unincorporated self-employed.

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

To assess whether the incorporated and unincorporated self-employed perform different tasks and run different types of businesses, we use the U.S. Department of Labor’s Dictionary of Occupational Titles (DOT) to measure the routine and nonroutine skills demanded of each occupation. 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 the conceptions of entrepreneurship articulated by an extensive body influential research on entrepreneurship, including Schumpeter (1911), Knight (1921), Baumol (1968, 1990), Lucas (1978), Murphy et al (1991), and Gennaioli et al. (2013).

- **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 and NLSY79 data, we follow Autor, Levy, and Murnane's (2003) pioneering work on technological change and the demand for routine and nonroutine labor inputs and use the codes provided on David Autor's website. 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 businesses run by incorporated and unincorporated business owners.

Table 2 provides summary statistics of the job task requirements across employment types. Panel A reports results for the CPS sample and Panel B reports summary statistics for the NLSY79 sample. In each panel, we present summary statistics on (1) the full sample of individuals and (2) the job task requirements of individuals last year if they were salaried workers last year. That is, we provide information on the job task requirements of their salaried jobs last year while differentiating by employment type this year.

Table 2 illustrates that (1) the incorporated self-employed engage in activities that demand greater nonroutine analytical skills than the unincorporated self-employed and salaried workers and (2) the unincorporated self-employed engage in jobs that demand greater manual skills than the incorporated self-employed *and* salaried workers. In both the CPS and NLSY79 samples, the incorporated self-employed have greater (a) Nonroutine Analytical and (b) Nonroutine Direction, Control, and Planning values than the unincorporated. In contrast, the unincorporated have larger Nonroutine Manual values. Aggregating the incorporated and unincorporated into a composite group of self-employed individuals blurs differences in the job task requirements of the activities associated with these distinct self-employment types.

The data in Table 2 also show that the sharp differences in the skills demanded of people who sort into incorporated and unincorporated self-employment exist before they become business owners. The summary statistics in Table 2 indicate that individuals who become incorporated self-employed engage, on average, previously worked in salaried jobs demanding more nonroutine cognitive skills than those who become unincorporated business owners or those who remain as salaried employees. In contrast, people who become unincorporated self-employed tended to previously work in salaried jobs demanding a higher-level of manual skills than those who become incorporated business owners or those who remain salaried workers. 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.

These summary statistics, however, have two key limitations. First, Table 2 simply reports the average values of the job task requirements for individuals across different employment types and does not control for other individual characteristics that might account for sorting into different employment types. Second, Table 2 does not provide information on the nature of the firms operated by the self-employed. That is, Table 2 does not address the question: do the incorporated and unincorporated self-employed run different types of businesses? We now address these considerations.

### **III. The Schumpeterian Entrepreneur and Other Self-employed Business Owners**

As stressed in the Introduction, we adopt a Schumpeterian conception of entrepreneurship in which entrepreneurs are economic leaders who introduce new goods, services, and production processes. From this perspective, entrepreneurship is not primarily about efficiently coordinating the operation of a firm; it is primarily about breaking from the normal, identifying new opportunities, and offering something novel to the market.<sup>5</sup>

Based on this view, we expect that entrepreneurs will engage in activities that demand comparatively high-levels of particular skills measured in the DOT. We expect that entrepreneurs will perform activities that demand disproportionately high-levels of Nonroutine Analytical and Nonroutine Direction, Control, and Planning skills, such as creative thinking, analytical flexibility, deft problem solving, and the ability to persuade others of the value of a new endeavor. In contrast, the Schumpeterian conception of entrepreneurship puts less weight on other skills measured in the DOT, such as Nonroutine Manual and Routine Analytical skills. Of course, the link between the Schumpeterian concept of entrepreneurship and the measures of job skill requirements in the DOT is imperfect. But, Schumpeter's focus on creative destruction is more closely aligned with nonroutine cognitive skills than it is with sound eye-hand coordination.

Combining the Schumpeterian conception of entrepreneurship, the DOT's measures of job skill requirements, and the defining features of the incorporated business form provides testable implications about our empirical measure of entrepreneurship. If entrepreneurs engage in activities that demand high-levels of nonroutine cognitive skills and if entrepreneurs favor the incorporated business form, then we should find that the incorporated self-employed perform activities that demand high-levels of expertise in creative thinking, analytical flexibility, adept problem solving, and the ability to motivate and persuade others. As noted in the Introduction, the incorporated

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<sup>5</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 entrepreneurs.



business form was developed over several centuries to facilitate investment in novel, risky endeavors. Although there are additional reporting and organization costs associated with incorporation, we expect that people opening innovative, risky firms will be more likely to select the incorporated business form than people initiating businesses to provide more routine services. Consequently, we now use the job task requirement data in the DOT to assess whether the incorporated self-employed perform different tasks and open different types of business from the unincorporated self-employed.

*A. Do the incorporated and unincorporated self-employed perform different activities?*

We use multinomial logit regressions to assess whether people who perform jobs that demand a high-level of Nonroutine Analytical, Nonroutine Direction, Control, and Planning (DCP), or Nonroutine Manual skills are more likely to be incorporated business owners than unincorporated self-employed or salaried workers. We examine the sorting into employment types based on the job task requirements of the individual as a salaried worker in year  $t-1$  using 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  $t-1$ .

Specifically we estimate a multinomial Logit model assuming that the log-odds of each response follow the following linear model:

$$h_{ijt} = \log \frac{P_{ijt}}{P_{ist}} = \alpha_j + \sum_{k=1}^3 \alpha_{j,NR,k} NR_{k,it-1} + \alpha_{j,X} X_{it-1}. \quad (1)$$

The dependent variable  $h_{ijt}$  is the log-odds ratio of being an incorporated (unincorporated) business owner rather than a salaried worker, where  $P_{ijt}$  stands for the probability that person  $i$  is unincorporated ( $j=1$ ) or incorporated self-employed ( $j=2$ ) in time  $t$  and  $P_{ist}$  denotes the probability that the person is a salaried worker in time  $t$ .  $NR_{k,it-1}$  is a vector of  $k=3$  nonroutine job specific skill requirements (Analytical, DCP, and Manual) of person's  $i$  salaried job in year  $t-1$ .  $X_{it-1}$  is a vector of regressors that includes demographics (race, gender), schooling, potential experience (quartic),

the number of hours worked in year  $t-1$ , as well as state and year fixed effects.  $\alpha_j$  is a constant and  $\alpha_{NR,k,j}$  is a vector of regression coefficients, for  $j = 1$ , unincorporated self-employed, and for  $j=2$ , incorporated self-employed.

The estimates reported in Table 3 provide four clear messages about the sorting into incorporated and unincorporated self-employment 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 demanded 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 3 offers 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.

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

Turning from the individual to the firm, we now examine whether incorporated businesses are different from unincorporated ones. We use the skills demanded of a firm's employees to characterize the nature of the business. That is, we assume that the tasks performed by a firm's workers provide information about the business and assess whether the skills demanded of the workers in incorporated firms differ materially from those demanded of workers in unincorporated businesses.

To do this, we construct measures of the job task requirements of each industry. We compute the hours-weighted job task requirements of all workers in each industry over the work years 1995 through 2012 for each of three categories of skills: (1) Nonroutine Analytical skills, (2) Nonroutine Direction, Control, and Planning skills, and (3) Nonroutine Manual skills. In Table 4, we list the top-5 and bottom-5 industries of these three categories of the hours-weighted job task requirements of industries. As shown, taxicab service, trucking service, and logging are top-5 industries with respect to demanding high-levels of manual skills from their workers, but they are bottom-5 industries in terms of demanding nonroutine analytical skills from those same employees. In turn, engineering and architectural services demand high-levels of analytical skills from workers, while the legal services and accounting industries do not requirement much in the way of nonroutine manual skills from their workers. Thus, the hours-weighted job task requirements of industries provide information on the characteristics of businesses.

This measure of the nature of businesses is imperfect. We would prefer to measure the tasks performed by each firm's workers, not just the job task requirements at the three-digit industry level, so that we could compare firms within an industry. Although we do not have such data, the industry-level data allow us to assess whether the incorporated self-employed are more likely to run businesses in industries that demand high levels of nonroutine cognitive skills than the unincorporated self-employed. Furthermore, we recognize that the job task requirements of workers within an industry might not perfectly characterize the nature of the businesses within that industry.

For example, there might be industries that both (a) provide comparatively novel services and (b) employ so many workers doing manual tasks that we categorize them as a high-manual and low-nonroutine-cognitive industries. That said, it seems unlikely that industries demanding high levels of nonroutine skills from workers will be systematically engaged in providing less novel products than industries that primarily demand a workforce with manual skills. Indeed, Table 4 indicates that the job task requirements of workers across industries do not yield an intuitively implausible ranking of industries.

Given this measure of the job task requirements of industries, we then assess whether incorporated businesses tend to be concentrated in industries demanding particular types of skills from workers. The sample includes individuals from the matched two-year CPS panel who were salaried workers in year  $t-1$  and are self-employed in year  $t$ . The dependent variables in the three columns reported in Table 5 are the hours-weighted values for Nonroutine Analytical, Nonroutine Direction, Control, and Planning, and Nonroutine Manual skills respectively demanded of workers in industries. The regressor is a dummy variable that equals one if the new business is incorporated and zero if the new business is unincorporated.

The results in Table 5 show that incorporated and unincorporated businesses are very different. 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 stronger manual skills from workers. Mashing together the incorporated and unincorporated aggregates away striking differences in the types of businesses run by the self-employed. Taken together, the results reported in Tables 3, 4, and 5 suggest that the incorporated self-employed are engaged in more analytically demanding businesses, while the unincorporated self-employed are more engaged in providing manual services.

#### IV. Who Becomes an Entrepreneur? Evidence from the NLSY79

Having established that the incorporated self-employed engage in activities and own firms that demand a comparatively high-level of nonroutine cognitive skills, we now focus on uncovering the cognitive and noncognitive traits associated with the self-sorting of individuals into different employment types. In particular, we use the unique attributes of the NLSY79 data to examine how the traits of individuals before they enter the prime age labor market account for subsequent career choices. Above, we focused on the skills demanded by particular jobs and industries. We now focus on the pre-labor market “supply” of cognitive and noncognitive traits. This section first provides definitions and summary statistics of the unique traits measured by the NLSY79. We then examine the self-sorting of individuals into incorporated and unincorporated self-employment based on these traits using multinomial logit regressions.

##### *A. Cognitive and Noncognitive Traits*

Besides the standard labor market outcome and demographic statistics summarized in Table 1, the NLSY79 provides unique information on individual and family traits. **AFQT score** (Armed Forces Qualifications Test score) 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.

**Rosenberg Self-Esteem score**, which is based on a ten-part questionnaire given to all NLSY79 participants in 1980, 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.

**Rotter Locus of Control** measures 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. It 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.

**Illicit Activity Index** measures the aggressive, risk taking, disruptive, “break-the-rules,” behavior of individuals based on the 1980 survey. 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 one 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 NLSY79 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. Summary statistics on traits*

Individuals who become incorporated self-employed have distinct family backgrounds, as shown in Panel A of Table 6. 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 *before* they enter the labor market (Table 6, Panel B). First, people who become incorporated self-employed had (1) higher "ability" as measured by AFQT values, (2) stronger self-esteem as measured by Rosenberg scores, and (3) stronger senses of controlling their futures, rather than having their futures determined by fate or luck, as measured by low Rotter Locus of Control scores. Second, people who 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. Furthermore, while the unincorporated self-employed also tended to engage in more illicit activities as youths than salaried workers, the incorporated engaged in still more.<sup>6</sup> All of these differences are statistically significant when using simple cross group t-tests.

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<sup>6</sup> For the aggregate group of self-employed, Fairlie (2002) shows that people who engaged in drug dealing as youths are more likely to become self-employed later in life.

In terms of these *ex ante* characteristics, it is perhaps unsurprising that entrepreneurship is associated with stronger cognitive aptitude abilities and exceptional confidence in one's abilities, but it is perhaps more surprising entrepreneurs tend to engage in more illicit activities as youths than those who 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), Zukerman (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 are more likely to have contributed to a patent. Panel C of Table 6 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 6 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. Selection on cognitive and noncognitive traits

To further assess the association between pre-labor market measures of cognitive and noncognitive traits and subsequent employment choices, we estimate a multinomial logit model assuming that the log-odds of each response follow the following linear model:

$$h_{ijt} = \alpha_j + \alpha_{j,A}AFQT_i + \alpha_{j,I}Illicit_i + \alpha_{j,AI}AFQT_i \cdot Illicit_i + \alpha_{j,CNC}NC_i + \alpha_{j,X}X_i. \quad (2)$$

The dependent variable  $h_{ijt}$  is the log-odds ratio ( $\log P_{ijt}/P_{ist}$ ) of being an incorporated (unincorporated) business owner rather than a salaried worker, where  $P_{ijt}$  is the probability that person  $i$  is unincorporated ( $j=1$ ) or incorporated self-employed ( $j=2$ ) in time  $t$  and  $P_{ist}$  denotes the probability that the person is a salaried worker. We focus on cognitive ability ( $AFQT$ ) and noncognitive ( $NC$ ) traits: the Rotter locus of control indicator, the Rosenberg self-esteem measure, and  $Illicit$ . We also include an interaction between  $AFQT$  and  $Illicit$ . All specifications control for gender, race, and year of birth. In several specifications, we control for the education of the parents and family income (in 1979) to the estimate model. All these variables are represented by the vector ( $X_i$ ) in equation (2). 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.

We report our findings in Table 7. In column (1), the Logit model assesses the probability of self-employment versus salaried; in columns (2) - (4), the comparison is between unincorporated self-employment and salaried; and in columns (5) - (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.

Several findings emerge. First, the incorporated self-employed tend to be white, men, people with high self-esteem, individuals with a strong sense of controlling one's future (i.e., a low Rotter locus of control score), individuals with high  $AFQT$  scores, those who engage in more illicit activities as youths, children of high-income parents, and people with well-educated mothers. The

economic magnitudes in Table 7 are large. For example, holding other things constant, the odds of a woman becoming an incorporated business owner rather than a salaried employee are more than 70% less than for a similar male. As another example, the odds of becoming incorporated self-employed rather than a salaried employee for a person with an AFQT score in the 60<sup>th</sup> percentile are 6.4% higher than for a person with the median AFQT score.<sup>7</sup>

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 more than 50% increase in the odds of becoming incorporated self-employed relative to those of becoming a salaried employee, after controlling for the person’s cognitive and noncognitive traits, 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 other factors, these results indicate that difficulties in obtaining finance materially influence incorporated self-employment but not unincorporated self-employment.<sup>8</sup>

Third, people who have *both* high AFQT scores *and* high Illicit Activity Index values are much more likely to become incorporated business owners. For example, compare two people who are the same except for their AFQT and Illicit values. If one has median values of AFQT and Illicit (so that AFQT\*Illicit equals zero) and the second is at the 75<sup>th</sup> percentile of both (so that AFQT\*Illicit is about  $0.1875=0.25*0.75$ ), then the odds of the second person becoming an incorporated self-employed business owners rather than a salaried employee are 6.3% greater ( $\exp\{0.327*0.1875\}$ ). The mixture of high learning aptitude and disruptive, “break-the-rules” behavior is tightly linked with entrepreneurship.

Fourth, Table 7 again emphasizes the differences in the pre-labor market characteristics of people who become incorporated and unincorporated self-employed business owners. While the unincorporated also engaged in more illicit activities as youths than salaried workers, they do not

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<sup>7</sup> AFQT was divided by 100 for the calculations in Table 7, which leads to the following calculation:  $1.0637=\exp\{0.618*0.1\}$ .

<sup>8</sup> Blanchflower and Oswald (1998) find that the probability of self-employment is positively related to whether the individual ever received an inheritance.

have higher AFQT scores or self-esteem values; and, they do not come from particularly high-income or well-educated families. Table 7 also shows that the combination of “smart” and “illicit” traits only boosts the probability of becoming incorporated self-employed.

#### *D. Selection on labor market productivity*

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 proceed as follows. We first compute each individual’s adjusted hourly wages (Adjusted wages) as a full-time, full-year salaried employee. We run a wage regression that controls for experience as well as year and individual effects and use the estimated individual effects as Adjusted wages. We then run a new battery of multinomial logit regressions to assess whether productivity as a salaried worker—as measured by Adjusted wages—explains sorting into employment types and reports the results in Table 8. Moreover, and critically, we include the interaction between Adjusted wages and the Illicit Activity Index to assess whether the mixture of “productive” and illicit characteristics shapes employment decisions. Furthermore, the regressions control for education and experience, as well as AFQT, the Rotter and Rosenberg Scores, Family income in 1979, and the education of each parent. To focus on a more homogeneous group of individuals, we only examine full-time, full year white males for the remainder of our analyses.

Table 8 reports two key results. First, there is *negative* sorting into the aggregate category of self-employment on Adjusted wages. Second, this reflects *opposite* sorting into incorporated and unincorporated self-employment. In particular, there is *positive* sorting into incorporated self-employment and negative sorting into unincorporated self-employment on Adjusted wages. We believe that this is the first paper to show that successful salaried workers are more likely to become entrepreneurs, while unsuccessful salaried workers are more likely to become unincorporated self-

employed business owners. Third, comparatively successful salaried workers who were *also* heavily engaged in disruptive activities as youths have higher propensities to become incorporated self-employed business owners later in life. This is reflected in the positive, significant coefficient on the interaction term Adjusted wages\*Illicit. Apparently, to the extent that Adjusted wages reflect productivity, it is a combination of comparatively high labor market productivity and a tendency to bend, if not break, the rules that influences who becomes an entrepreneur.

#### *E. Traits, employment types, and job task requirements*

We now examine the sorting into different types of business activities on both the legal form of the business and the underlying traits of the business owner. With the CPS data, we showed 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 manual skills from their workers but a relatively low degree of nonroutine cognitive skills.

With the NLSY79, we can now match the cognitive and noncognitive traits of the individual business owner with the nature of his business. That is, we can now examine the matching between the traits of individuals before they enter the labor market—as measured by AFQT and Illicit—with the nature of the businesses, if any, that they later run. We measure the nature of the business by the job task requirements of the people employed by the business's industry.

Table 9 provides regressions in which the dependent variable is a measure of the job task requirements of the industry in which each individual works. The reported explanatory variables are dummy variables of whether the individual is an incorporated or unincorporated business owner, where salaried employment is the excluded group. To measure the job task requirements of an industry, we again use the hours-weighted measure of the skills required of workers in each industry and we again examine three categories of skills: nonroutine analytical, nonroutine direction, control and planning, and nonroutine manual. The NLSY79 survey is conducted every other year starting in

1994. We further restrict the sample to individuals who were salaried in the last NLSY79 survey, i.e., in year  $t-2$ . Thus, we compare people who remain salaried with those who switch into incorporated or unincorporated self-employment. The regressions also control for individual and year fixed effects, and a quartic in experience. To work with a more homogeneous group, we restrict the sample to white males.

For each of the three categories of job task requirements, we examine four subsamples of individuals: (1) individuals with below (or equal to) the median values of either AFQT or Illicit ( $AFQT \leq 50$  or  $Illicit \leq 0$ ); (2) “smart and illicit” individuals with above the median values of both AFQT and Illicit ( $AFQT > 50$  and  $Illicit > 0$ ); (3) “very smart and illicit” individuals with above the 75<sup>th</sup> percentile AFQT scores and an Illicit index value that is greater than the median ( $AFQT > 75$  and  $Illicit > 0$ ); and (4) “very smart but not illicit” individuals who have above the 75<sup>th</sup> percentile AFQT scores but below (or equal to) the median values of the Illicit index ( $AFQT > 75$  and  $Illicit \leq 0$ ).

We find that it is important to differentiate the underlying cognitive and noncognitive traits of the incorporated business owner when assessing the nature of the business. For example, when “smart and illicit” individuals run incorporated businesses, they tend to be in industries that demand comparatively high-levels of creative thinking, analytically advanced problem solving, and communication skills from workers. This tendency is even stronger for the “very smart and illicit” individuals. By comparing regressions (2) and (3) and (6) and (7), notice that the estimated coefficient on Incorporated is more than twice as large for the sample of individuals with  $AFQT > 75$  and  $Illicit > 0$  than for the sample of individuals with  $AFQT > 50$  and  $Illicit > 0$ . Also, notice that the “very smart but *not* illicit” group of individuals who become incorporated business owners do *not* have a stronger tendency to open these types of businesses. The nature of the individual as a youth helps account for the type of incorporated business he runs later in life.

Table 9 also provides insights on unincorporated businesses. When “smart and illicit,” and even when “very smart and illicit,” individuals become *unincorporated* business owners, the businesses are not disproportionately in industries that demand strong analytical skills from workers.

Rather, when most types of people open unincorporated businesses, they tend to be in industries that demand strong eye, hand, and foot coordination. Thus, even among people with smart and illicit traits as youths, those who later run incorporated businesses are more likely to run businesses that demand high levels of creative thinking, analytically advanced problem solving, and communication skills from workers; but, those who instead run unincorporated businesses are not more likely to run such analytically demanding businesses.

These analyses further advertise the value of disaggregating the self-employed into incorporated and unincorporated business owners. People with smart and illicit traits as youths are more likely to own incorporated businesses that demand high levels of creative thinking, analytically advanced problem solving, and communication skills from their workers. In contrast, the unincorporated self-employed, even those with smart and illicit traits as teenagers, do not tend to run businesses with such demanding analytical skills. These findings are consistent with the view that the choice of the legal form of the business signals the nature of the planned business activity and suggest that when people start businesses engaged in more nonroutine activities—for which limited liability and the separate legal identity were created—they are more likely to select the incorporated business form.

## **V. Entrepreneurs: Do They Earn More?**

### *A. Economic interpretation*

In this section, we address the question: What happens to the earnings of individuals who choose to become incorporated or unincorporated businesses owners? Neither the decision to become self-employed nor the decision to incorporate is exogenous to earnings. Indeed, sections III and IV documented the sorting of individuals with different underlying traits into different occupations and employment types. Thus, we limit our interest to the question of whether individuals earn more when they choose to run incorporated (or unincorporated) businesses.

Let  $\beta_I$  and  $\beta_U$  measure the extra earnings associated with incorporated and unincorporated self-employment reflecting either (i) higher (or lower) pay for the same labor inputs or (ii) a change

in the supplied labor inputs (ideas and effort) for the same pay. Thus, we can represent the hourly earnings of person  $i$  in time  $t$  ( $E_{it}$ ) using the following linear reduced form statistical model:

$$E_{it} = \beta_S + \beta_I I_{it} + \beta_U U_{it} + \beta_X X_{it} + \varepsilon_{it}, \quad (3)$$

where  $I_{it}$  equals one if individual  $i$  is incorporated self-employed in period  $t$  and zero otherwise,  $U_{it}$  is a similarly defined dummy for when individual  $i$  is an unincorporated business owner,  $X_{it}$  are time-varying individual characteristics, such as education, age, and experience, and  $\varepsilon_{it}$  is an error term that captures unobserved (a) time-invariant ( $\theta_i$ ) and time-varying ( $v_{it}$ ) person-specific influences on earnings.

The earnings differentials between the incorporated (and unincorporated) self-employed and salaried workers reflect the additional earnings from choosing to be a business owner and selection effects. To illustrate, consider the OLS estimate of  $\beta_I$ :

$$\beta_I^{OLS} = \beta_I + (\theta_I - \theta_S) + (v_{TI} - v_{TS}), \quad (4)$$

where  $\theta_I$  is the average value of the fixed effect for the incorporated self-employed, and  $\theta_S$  is the average value of the fixed effect of salaried workers; and where  $v_{TI}$  is the average value of the time-varying, person-specific influences on earnings during the time period when individuals are incorporated self-employed business owners, and  $v_{TS}$  is similarly defined for salaried employees.

In terms of the selection effects, the first type of selection effect reflects sorting on time invariant characteristics:  $(\theta_I - \theta_S)$ . This will be positive if talented people are more likely to incorporate.

The second type of selection reflects sorting on time-varying changes to a person's earnings:  $(v_{TI} - v_{TS})$ . First, there could be selection into the incorporated legal form based on the success of the business. For example, incorporation might be an ex post choice made by successful businesses, not an ex ante choice made by people selecting the most effective legal form for their distinct businesses. If businesses start as unincorporated firms and then incorporate if they are successful,

then estimating equation (1) overstates the earnings associated with incorporated self-employment and understates the earnings associated with starting an unincorporated business. Second, there could be selection out of self-employment if the business is unsuccessful, as emphasized by Manso (2015). Such survivorship bias, if not unaccounted for, could contaminate the estimated increase in earnings associated with entry into self-employment. Finally,  $(v_{TI} - v_{TS})$  might reflect other influences, including “on the job training” or systematic differences in the trajectory of the earnings of people who are most likely to incorporate. For example, some individuals might receive low wages when they are young employees as a means of “paying” for the accumulation of non-firm-specific human capital, which is then expected to yield positive returns in the form of greater future earnings. If the propensity to incorporate is strongly associated with receiving a comparatively large boost in human capital from such “on the job training,” then incorporation will be associated with an especially large boost in earnings as individuals realize the returns from the earlier accumulation of human capital. Similarly, if people with steeper earnings profiles have a higher propensity to become incorporated self-employed, this could yield the same type of bias. From these perspectives, the jump in earnings that accompanies the switch from salaried work to incorporated self-employment might reflect the realization of “on the job training” or a steeper earnings profile, not earnings gains from entrepreneurship per se.

In this paper, we are the first to use panel data and associated methods to address these considerations. First, we use individual effects to account for selection on time invariant person-effects. Given the findings on selection reported above, we expect that controlling for person effects will materially shape the estimated value of  $\beta_I$ . Second, we control for selection into and out of incorporated and unincorporated self-employment. With respect to potential biases arising from selection between self-employment categories, we (1) assess whether many firms switch between the incorporated and unincorporated business form and (2) conduct the analyses while excluding all firms that switch self-employment types. With respect to survival bias, we use the timing of first entry into incorporated (unincorporated) self-employment rather than the current employment type to estimate the change in earnings associated with becoming a business owner. Finally, with respect



to on-the-job-training, we examine whether there is a break in an individual's earnings profile associated with a switch into, or out of, incorporated self-employment by examining the relationship between changes in earnings and changes in employment type while controlling for person specific effects.

### *B. Evidence from the CPS*

Table 10 presents the results of twelve hourly earnings regressions based on equation (3), where Panels A and B present the results from the CPS and NLSY79 data respectively. In each panel, the first three columns provide OLS regressions and the next three provide median analyses. 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>9</sup> We present the regression results for the sample of white, prime age (25-55) males, who work full-time full-year. The results are robust to expanding the sample. To allow for nonpositive self-employment earnings, we examine hourly earnings rather than log hourly earnings.

We report the coefficient estimates on two explanatory variables. Incorporated (Unincorporated) equals one if the individual is incorporated (unincorporated) self-employed and zero otherwise. For the CPS analyses, we conduct the analyses on (1) the full sample, (2) the subsample of individuals for whom we have a matched two-year panel when controlling for individual fixed effects, and (3) the matched two-year panel, where we examine the change in an individual's hourly earnings and use the same regressors as in the other specifications.<sup>10</sup> 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

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<sup>9</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.

<sup>10</sup> Conducting the CPS analyses using the matched two-year panel sample without fixed effects yields virtually the same parameter estimates as those reported in columns (1) and (4).

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.

The results from the CPS sample reported in Table 10 indicate that (1) the average and median incorporated self-employed business owner earns more than his salaried and unincorporated counterparts, (2) the average and median unincorporated business owner earns less than his counterparts, and (3) there is positive selection into incorporated self-employment based on earnings as a salaried employee.

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 15% 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 27% less than a salaried worker with similar Mincerian traits.

We also control for selection on individual effects,  $(\theta_I - \theta_S)$ , by using the two-year matched CPS sample. Since we only have a two-year panel, the analyses only capture the first year of the switch from salaried work to self-employment. 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 extend these analyses by exploiting the longer time-series dimension of the NLSY79. The NLSY79 allows us to assess the relationship between earnings and whether an individual has ever been self-employed.

Individuals who become incorporated business owners tend to experience an increase in their hourly earnings, while individuals who self-sort into unincorporated business ownership tend to experience a large decrease in their hourly earnings. The fixed effect regression indicates that an individual who becomes an incorporated business owner 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 who become unincorporated business owners tend to experience an almost 18% 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 remained salaried employees. To see this, compare the regressions with and without fixed effects. The regression without fixed effects indicates that mean residual earnings of an individual are 35% greater in the first year after becoming an incorporated business owner relative to a person with similar Mincerian traits who remains salaried. The fixed effects regression indicates that the average residual earnings of an individual are 9% 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% ( $=35 - 9$ ) 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, on average, earnings tend to rise by about 9% in the first year. Moreover, we find essentially the same coefficient estimates when examining *changes* in hourly earnings.

All of these patterns are essentially the opposite for the unincorporated self-employed. First, the incorporated self-employed tended 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.

Distinguishing between the incorporated and unincorporated provides notably different perspectives about entrepreneurship from those in the literature and accounts for the literature's puzzling results on self-employment. In terms of the earnings puzzle, we show that 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. Indeed, using the incorporated self-employed as a proxy for entrepreneurship, we find that entrepreneurs earn more per hour than their salaried and unincorporated self-employed counterparts. Moreover, we show that when a person shifts into incorporated self-employment his hourly earnings tend to rise; but those who switch into unincorporated self-employment tend to experience a drop in hourly earnings.

### *C. Evidence from the NLSY79*

Panel B in Table 10 provides the corresponding earnings analyses based on the NLSY79.<sup>11</sup> Since the NLSY79 survey is conducted every other year since 1994, the differencing is done between years  $t$  and  $t-2$ .

The NLSY79 data depicts similar patterns with respect to the incorporated self-employed as those found using the CPS. 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. The estimates in regressions (7) and (8) indicate that the average person—who at some point in his career is incorporated—enjoys residual earnings of about 35 percent (=53% – 18%) more as a salaried worker than a salaried worker with the same observable traits, but who never incorporates. Second, when an individual becomes incorporated, his hourly earnings tend to rise markedly. On average, earnings rise 18 percent after a person becomes incorporated. Evaluated at the median, the difference is 6 percent. Moreover, we find very similar coefficient estimates when examining *changes* in hourly earnings.<sup>12</sup> Third, the patterns are quite different for

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<sup>11</sup> We report regression results using OLS and median regressions. We have also examined the full distribution of earnings across employment types. 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. In contrast, the unincorporated self-employed have a comparatively fat left tail. These findings are available upon request.

<sup>12</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

the unincorporated self-employed. On average, a person's hourly 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. Regressions (10) and (11) illustrate that (1) individuals who at some point in their careers become unincorporated self-employed business owners tend to have 11 percent lower median hourly earnings as salaried workers than comparable salaried workers, and (2) they experience a further drop of 2 percent in median hourly earnings when they make the switch to self-employment. These results are robust to several concerns.<sup>13</sup>

#### *D. Sorting out*

Although we have controlled for selection on time invariant factors, we now consider survivorship bias, i.e., “sorting out” to paid employment when self-employment is less profitable than expected. Recall from the two-year panel CPS analyses that earnings for the incorporated self-employed are materially higher in the first year after they switch from salaried work to incorporated self-employment. By examining this switch, the analyses reduce the possible positive bias on the estimated earnings associated with selective exit from incorporated self-employment. We now use the longer panel of the NLSY79 to address such sorting out of self-employment. In particular, we examine the relationship between earnings and whether a person has ever been self-employed.

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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>13</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.

Specifically, we include two indicator variables: (1) Ever Incorporated equals one since the first year that a person becomes incorporated and (2) Ever Unincorporated, which equals one since the first year that a person becomes unincorporated. In this way, we assess whether a person's future earnings rise after he first becomes self-employed, regardless of whether he returns to salaried employment.

The results presented in Table 11 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. That is, Ever Incorporated enters positively and significantly in regressions (1) and (3). Second, we find substantial survivorship bias for both types of self-employment. To assess this, we simultaneously introduce into the earnings regression both Incorporated, Unincorporated, Ever Incorporated, and Ever Unincorporated. Thus, we include information on current and past employment types. We find that when a person is an incorporated business owner, his earnings per hour are greater than when he was salaried even when conditioning on whether he was ever a business owner in the past. That is, Incorporated enters positively and significantly in regressions (2) and (4). Third, we find that individuals who experiment with entrepreneurship and then return to salaried employment do not earn less than they were earning as salaried workers before they tried self-employment. On average, the person returns to a higher paying job (the estimated coefficient on Ever Incorporated in regression (2)), but there is no difference at the median (the estimated coefficient on Ever Incorporated in regression (4)).

The Table 11 results on unincorporated self-employment offer a stark contrast. First, the coefficient estimates on Ever Unincorporated in regressions (1) and (3) indicate that after an individual becomes an unincorporated self-employed business owner, his future hourly earnings fall regardless of whether he returns to salaried employment. Second, consider the coefficient estimates on Ever Unincorporated in regressions (2) and (4), which condition on an individual's current employment type. The results indicate that when a person returns to salaried employment after being an unincorporated business owner, his hourly salaried earnings are smaller than they were before becoming a business owner.

### *E. Sorting in: Transitions across employment types*

As discussed above, one potential concern is that successful unincorporated businesses incorporate. Such ex post sorting into different legal forms is inconsistent with the results presented above. For instance, such selection would not account for (a) the different job task requirements of the occupations of people who become incorporated and unincorporated self-employed or (b) the different cognitive and noncognitive traits of people who 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, “sorting in” is relatively unimportant: very few people switch the legal forms of their businesses. Exceedingly few unincorporated business incorporate and very few incorporated business become unincorporated. Results from the CPS data indicate even less switching between the unincorporated and incorporated business form. Moreover, even when we exclude those firms that switch among self-employment types, we obtain the same results. The data are consistent with the view that people choose the legal form of their businesses ex ante based on which legal form best suits the nature of the planned activities of the business. And, the data are inconsistent with the view that sorting into the incorporated or unincorporated legal form based on the firm’s success accounts for the reported findings on earnings.

### *F. 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. In Panel A of Table 12, we examine the relationship between the number of hours worked during a year and employment, while controlling for standard Mincerian traits, key cognitive and noncognitive traits (AFQT, Rosenberg Self-Esteem score, Rotter Locus of Control score, Illicit Activity Index), as well as person fixed

effects (or deviations from the person's median in the median regressions). In Panel B, we run similar regressions, where the dependent variable is either hourly earnings or annual earnings.

As shown, an individual works more when he is a self-employed business owner than a salaried employee. On average, when a person is either an incorporated or unincorporated self-employed business owner, he works about seven or eight percent more than when he was salaried. This amounts to almost 200 extra work hours per year. Hence, self-employment involves a material jump in “effort,” as measured by hours worked.

Moreover, we find that the self-employed—incorporated and unincorporated business owners—earn more per annum than they were earning as salaried workers. As shown in Panel B of Table 12, an individual earns more per annum as a self-employed business owner than he makes as a salaried employee. On average, an individual earns about 18% more per hour and 29% more per annum as an incorporated business owner than as a salaried employee. In turn, an individual does not earn more per hour as an unincorporated business owner, but garners 9% more in annual earnings. Even at the median, we find an individual earns 2% less per hour as an unincorporated business owner, but earns 2% more per year because he works so many more hours.

These results provide a new perspective on self-employment. Hurst and Pugsley (2011) stress the nonpecuniary benefits of being one's own boss. Our findings also advertise the pecuniary benefits of self-employment: People have the flexibility to work more hours to boost annual earnings. While the median unincorporated individual earns less per hour, he makes almost \$1,000 more per year than he earns as a salaried employee.

### *G. Differential returns to traits across employment types*

We now examine whether the same traits associated with selection into entrepreneurship also associated with the differential earnings of entrepreneurs. In Table 13, the dependent variable is the change in hourly earnings. We differentiate individuals along the same dimensions of “smart and illicit” and “productive and illicit” that we used to examine the self-sorting of individuals into different employment types. In particular, we differentiate people by the combination of AFQT and



Illicit in regressions (1) and (2) and by the combination of Adjusted wages and Illicit in regressions (3) and (4). We then assess the change in earnings associated with switching into or out of incorporated and unincorporated self-employment based on whether the person has particularly high levels of AFQT\*Illicit or particularly high levels of Adjusted wages\*Illicit.

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 13 indicate that the positive association between a change in earnings and a switch into incorporated self-employment exists especially for high ability individuals (as measured by either high AFQT or high Adjusted wages) who also exhibit a greater tendency to break the rules as youths (as measured by high values of the Illicit index). 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 the same traits that account of earnings 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).<sup>14</sup> Lazear (2004, 2005) stresses that entrepreneurs must be “jacks-of-all-trades” to coordinate factor inputs successfully. 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.

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<sup>14</sup> Hartog, Praag, and Sluis (2010) do not find differences in the traits of the self-employed relative to salaried workers.

## VI. Conclusions

We disaggregate the self-employed into the incorporated and unincorporated to distinguish between “entrepreneurs” and other business owners. We show that incorporated business owners tend to engage in jobs that demand stronger nonroutine cognitive skills than either unincorporated business owners or salaried workers. In contrast, unincorporated business owners tend to perform tasks that demand manual skills. To the extent that one associates entrepreneurship with analytical reasoning, creativity, and complex interpersonal communications rather than with eye, hand, and foot coordination, the data suggest that on average the incorporated self-employed engage in entrepreneurial activities while the unincorporated do not. Thus, there are material problems with using the aggregate group of self-employed as an empirical proxy of entrepreneurship.

We discover that entrepreneurs—as proxied by the incorporated self-employed—earn more and have a very distinct mixture of cognitive and non-cognitive traits than salaried workers and other business owners. 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 person who tends to “break-the-rules” as a youth who is especially likely to become a successful entrepreneur.

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**Table 1: Demographics and Labor Market Outcomes by Employment Type, CPS and NLSY79**

	All	Salaried	All	Self-Employed Uninc.	Inc.
<b>Panel A: CPS 1996 - 2012</b>					
Observations	1,225,886 100.0%	1,108,591 90.4%	117,295 9.6%	75,476 6.2%	41,819 3.4%
<i>A. Labor Market Outcomes</i>					
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 Worked	1985	1976	2078	1936	2331
Full-Time, Full-Year	0.69	0.70	0.64	0.57	0.78
<i>B. Demographics</i>					
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>Panel B: NLSY79 1982-2012</b>					
Observations	132,681 100.0%	121,782 91.8%	10,899 8.2%	8,963 6.8%	1,936 1.5%
<i>A. Labor Market Outcomes</i>					
Mean Earnings	\$ 44,725	\$ 43,605	\$ 55,785	\$ 45,713	\$ 93,411
Median Earnings	\$ 35,170	\$ 35,222	\$ 33,965	\$ 28,672	\$ 61,424
Median Hourly Earnings	\$ 17.2	\$ 17.2	\$ 16.8	\$ 14.7	\$ 26.2
Annual Hours Worked	1966	1953	2088	1991	2461
Full-Time, Full-Year	0.59	0.59	0.53	0.48	0.72
<i>B. Demographics</i>					
Age	36.2	36.0	38.1	37.5	40.1
White	0.81	0.80	0.87	0.86	0.90
Female	0.47	0.48	0.38	0.41	0.28
Years of Schooling	13.8	13.8	13.6	13.4	14.2
College Graduate (or more)	0.30	0.30	0.26	0.23	0.36



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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), and from the Bureau Labor of Statistics' National Longitudinal Survey of Youth 1979 (NLSY79) for workers who are least 25 years old between 1982 and 2012. The CPS and the NLSY79 classify 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. The sample excludes persons who do not work either as salaried or self-employed, people with missing data on relevant demographics and labor market outcomes who live within group quarters (CPS).

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**Table 2: Job Task Requirements by Employment Type, CPS and NLSY79**

	All	Salaried	All	Self-Employed Uninc.	Inc.
<b>Panel A: CPS 1996 - 2012</b>					
<i>1. Job Task Requirements</i>					
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
<i>2. Job Task Requirements Last Year (if salaried)</i>					
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
<b>Panel B: NLSY79 1982-2012</b>					
<i>1. Job Task Requirements</i>					
Nonroutine Analytical	3.72	3.73	3.65	3.46	4.49
Nonroutine Direction, Control, Planning	2.73	2.69	3.12	2.84	4.33
Nonroutine Manual	1.05	1.03	1.19	1.24	0.96
<i>2. Job Task Requirements Last Year (if salaried)</i>					
Nonroutine Analytical	3.72	3.73	3.69	3.55	4.30
Nonroutine Direction, Control, Planning	2.67	2.67	2.69	2.45	3.68
Nonroutine Manual	1.05	1.03	1.17	1.22	0.97
<p>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), and from the Bureau Labor of Statistics' National Longitudinal Survey of Youth 1979 (NLSY79) for workers who are least 25 years old between 1982 and 2012. For Panels A and B, 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 A.2 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 match overtime following the guidelines in Madrian and Lefren (2000) and (b) were salaried workers in year <math>t-1</math>.</p>					

**Table 3: Selection into Unincorporated and Incorporated Self-Employment, CPS Panel**

	<u>Unincorporated</u>	<u>Incorporated</u>
	(2)	(4)
<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 people who do not work either as salaried or self-employed, people with missing data on relevant demographics and labor market outcomes, and people living within group quarters. The analyses include 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 4: Top and Bottom Industries by Nonroutine Job Task Requirements, CPS**

Nonroutine Analytical Industry		Nonroutine Direction, Control, Planning Industry		Nonroutine Manual Industry	
<i>Panel A: Top Industries</i>					
Engineering and architectural services	6.56	Educational services	6.23	Taxicab service	4.26
Accounting, auditing, and bookkeeping services	5.84	Engineering and architectural services	6.05	Trucking service	3.52
Miscellaneous professional and related services	5.34	Accounting, auditing, and bookkeeping services	5.05	Street railways and bus lines	3.14
Security and commodity brokerage and investment companies	5.16	Advertising	4.93	Logging	2.66
Aircraft and parts	5.08	Theaters and motion pictures	4.90	Water transportation	2.16
<i>Panel B: Bottom Industries</i>					
Private households	0.99	Private households	0.45	Legal services	0.07
Logging	2.07	Taxicab service	0.57	Accounting, auditing, and bookkeeping services	0.09
Taxicab service	2.18	Postal service	0.98	Insurance	0.16
Trucking service	2.19	Trucking service	1.04	Security and commodity brokerage and investment	0.18
Laundering, cleaning, and dyeing services	2.30	Legal services	1.25	Banking and credit agencies	0.21

Notes: This table reports the top and the bottom five industries in each of three categories of job task requirements from the Dictionary of Occupational Titles. For each industry, we compute the hours-weighted job task requirements of people working in the industry over the work years 1995 through 2012. We do this for three categories of skills for each: (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.

**Table 5: Differences in Task Requirements of Incorporated and Unincorporated Businesses CPS Panel**

	<b>The Task Requirements of the Industry of the New Business:</b>		
	Nonroutine Analytical Industry (1)	Nonroutine Direction, Control, Planning Industry (2)	Nonroutine Manual Industry (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 job task requirements of the businesses of newly self-employed individuals on whether the business is incorporated or unincorporated. For each industry, we compute the hours-weighted job task requirements of people working in the industry over the work years 1995 through 2012. We do this for three categories of skills for each: (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. To the businesses of newly self-employed individuals, we assign the hours-weighted job task requirements of the business's industry. To examine the newly self-employed, we restrict the matched two-year CPS panel sample to individuals who were full-time, full-year salaried workers in year t-1 and who became self-employed in year t. 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 6: Home Environment, Early Personal Traits, and Entrepreneurial-Related Activities, NLSY79**

	All	Salaried	All	Self-Employed Uninc.	Inc.
<b>A. Family background</b>					
Mother's Education	11.7	11.7	12.0	11.8	12.6
Father's Education	11.9	11.9	12.2	12.1	12.7
Two parents family (14)	0.76	0.76	0.77	0.76	0.83
Family Income in 1979	\$ 57,431	\$ 57,140	\$ 60,182	\$ 57,567	\$ 70,317
<b>B. Cognitive and non-cognitive traits</b>					
AFQT	50.1	50.0	51.4	50.4	55.2
Rotter Locus of Control (standardized)	-0.10	-0.09	-0.18	-0.16	-0.28
Rosenberg Self-Esteem (standardized)	0.08	0.07	0.10	0.06	0.27
Illicit Activity Index (standardized)	0.01	0.00	0.12	0.10	0.20
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	0.26
<b>C. Self-designation and invention (2010)</b>					
Entrepreneur (standardized)	0.00	-0.07	0.77	0.66	1.20
Applied for Patent (standardized)	0.00	-0.01	0.07	0.01	0.30

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). 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 report the standardized measures.

**Table 7: Selection into Employment Types on Cognitive, Noncognitive, and Family Traits, NLSY79**

<i>Self-Employment by Type:</i>	<b>All (vs Salaried)</b> (1)	<b>By Type (vs Salaried)</b>					
		<b>Unincorporated</b>			<b>Incorporated</b>		
		(2)	(3)	(4)	(5)	(6)	(7)
<b><i>Cognitive and Non-cognitive Traits</i></b>							
AFQT	0.076 (0.115)	-0.046 (0.124)	-0.042 (0.124)	-0.115 (0.132)	0.618*** (0.235)	0.576** (0.237)	0.069 (0.261)
Illicit	0.078*** (0.027)	0.070** (0.029)	0.133*** (0.048)	0.122** (0.048)	0.122** (0.055)	-0.023 (0.093)	-0.042 (0.097)
Rosenberg Score	0.031 (0.029)	-0.007 (0.031)	-0.009 (0.031)	-0.014 (0.031)	0.211*** (0.059)	0.216*** (0.059)	0.192*** (0.060)
Rotter Score	-0.097*** (0.028)	-0.089*** (0.030)	-0.087*** (0.030)	-0.085*** (0.030)	-0.141** (0.056)	-0.144*** (0.056)	-0.131** (0.056)
<b><i>AFQT*Illicit</i></b>			-0.163 (0.104)	-0.151 (0.104)		0.306* (0.157)	0.327** (0.163)
<b><i>Demographics</i></b>							
Black	-0.560*** (0.072)	-0.504*** (0.075)	-0.501*** (0.075)	-0.537*** (0.077)	-0.887*** (0.164)	-0.898*** (0.165)	-0.777*** (0.168)
Hispanic	-0.318*** (0.076)	-0.332*** (0.079)	-0.328*** (0.079)	-0.273*** (0.085)	-0.253 (0.166)	-0.260 (0.167)	0.043 (0.176)
Female	-0.340*** (0.055)	-0.260*** (0.059)	-0.261*** (0.059)	-0.266*** (0.059)	-0.727*** (0.119)	-0.724*** (0.119)	-0.708*** (0.119)
<b><i>Family Traits</i></b>							
<i>Family Income</i>				-0.070 (0.099)			0.449*** (0.161)
<i>Mother Education</i>				0.017 (0.014)			0.086*** (0.027)
<i>Father Education</i>				0.010 (0.011)			0.010 (0.021)
Observations	125166	125166	125166	125166	125166	125166	125166

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, 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). 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 8: Selection of Salaried Workers into Different Self-Employment, NLSY79**

<i>Self-Employment by Type:</i>	Self- Employed (1)	Unincorporated		Incorporated	
		(2)	(3)	(4)	(5)
<b>Adjusted wages</b>	-0.365*** (0.123)	-0.653*** (0.122)	-0.672*** (0.136)	0.685** (0.286)	0.545** (0.277)
<b>Illicit</b>	0.083* (0.043)	0.069 (0.049)	0.075 (0.054)	0.132* (0.072)	0.109 (0.073)
<b>Adjusted wages * Illicit</b>			0.026 (0.076)		0.412** (0.172)
<b>Controlling for</b>					
AFQT, Rotter and Rosenberg scores	Yes	Yes	Yes	Yes	Yes
Family income and parents' education	Yes	Yes	Yes	Yes	Yes
Education and experience	Yes	Yes	Yes	Yes	Yes
Observations	33405	33405	33405	33405	33405

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. Adjusted Wages are computed as the person fixed effect from a Mincerian log wage regression when people work as full-time, full-year salaried workers, where the wage regression is estimated over the full sample period. 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 (non-Hispanic) males who are at least 25 years old. 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 9: Differences in Job 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			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Incorporated	0.058 (0.058)	0.106* (0.065)	0.300*** (0.079)	0.114 (0.113)	-0.034 (0.093)	0.222** (0.101)	0.552*** (0.138)	0.026 (0.146)	0.030 (0.056)	-0.036 (0.049)	-0.129* (0.067)	-0.083 (0.079)
	0.058		0.300	0.114	-0.034	0.222	0.552	0.026	0.030	-0.036	-0.129	-0.083
Unincorporated	-0.053 (0.031)	0.053 (0.053)	0.075 (0.082)	0.065 (0.079)	-0.233*** (0.045)	-0.141** (0.070)	-0.236** (0.096)	-0.213* (0.119)	0.224*** (0.027)	0.099** (0.042)	0.074 (0.065)	0.114** (0.055)
	-0.053	0.053	0.075	0.065	-0.233	-0.141	-0.236	-0.213	0.224	0.099	0.074	0.114
<b>Sample</b>												
AFQT	< = 50	> 50	> 75	> 75	< = 50	> 50	> 75	> 75	< = 50	> 50	> 75	> 75
Illicit Index	or <= 0	and >0	and >0	and <=0	or <= 0	and >0	and >0	and <=0	or <= 0	and >0	and >0	and <=0
Observations	23047	7263	3897	5988	23047	7263	3897	5988	23047	7263	3897	5988
R-square	0.585	0.603	0.635	0.591	0.558	0.581	0.591	0.606	0.604	0.585	0.615	0.607

Notes: The dependent variable is the job task requirements of the industry in which the individual works, either as a business owner or as an employee. For each industry, we compute the hours-weighted job task requirements of people working in the industry over the work years 1995 through 2012. We do this for three categories of job task requirements: (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. Data on job task requirements are from Autor, Levy, and Murnane (2003), who link data on the Dictionary of Occupational Titles with occupational categories. The sample includes prime age white males, who were salaried workers in year t-2. The regressions include Incorporated and Unincorporated, which equal one if the individual is incorporated self-employed or unincorporated self-employed respectively in year t and zero otherwise. The regressions are also divided by whether individuals have above or below the average values of illicit and by different AFQT scores. 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 10: Hourly Earnings and Individual Effects, CPS Panel and NLSY79**

	OLS (Means)			Quantile (Median)		
	Full Sample	Fixed Effects	Differenced	Full Sample	Median Effects	Differenced
	(1)	(2)	(3)	(4)	(5)	(6)
Incorporated	10.165*** (0.468)	2.630*** (0.761)	2.440** (0.930)	1.930*** (0.105)	0.500*** (0.086)	0.662*** (0.145)
Unincorporated	-4.176*** (0.398)	-4.914*** (1.066)	-5.130*** (1.068)	-6.337*** (0.103)	-3.895*** (0.097)	-4.063*** (0.160)
<b>% Difference from Mean Salaried Worker</b>						
Incorporated	35.3%	9.1%	8.5%	8.3%	2.1%	2.8%
Unincorporated	-14.5%	-17.1%	-17.8%	-27.2%	-16.7%	-17.5%
Observations	351,746	144,930	72,465	351,746	144,930	72,465
R-square ( Pseudo R2)	0.164	0.767	0.003	0.1148	0.0018	0.0030
<b>Panel B: NLSY79</b>						
	(7)	(8)	(9)	(10)	(11)	(12)
Incorporated	13.141*** (2.250)	4.384*** (1.407)	3.935** (1.978)	5.317*** (0.483)	1.147*** (0.252)	0.916*** (0.346)
Unincorporated	0.376 (1.062)	0.739 (0.665)	-0.468 (0.806)	-2.737*** (0.316)	-0.450*** (0.165)	-1.032*** (0.247)
<b>% Difference from Mean Salaried Worker</b>						
Incorporated	53%	18%	16%	26%	6%	4%
Unincorporated	2%	3%	-2%	-13%	-2%	-5%
Observations	23657	23657	18054	23657	23657	18054
R-square ( Pseudo R2)	0.255	0.625	0.011	0.1361	0.0737	0.0121

Notes: This table reports regression results of hourly earnings on employment type using data from the (a) CPS for work years 1995 through 2012 and (b) the NLSY79 for years 1982 through 2012. The table provides estimated coefficients from OLS and median regressions 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 (for CPS) 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 with missing data on relevant demographics. The CPS 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 (Median 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 11: Hourly Earnings After First Entry into Self-Employment, NLSY79**

	Means (OLS)		Medians (Quantile)	
	(1)	(2)	(3)	(4)
Ever Incorporated	4.083*** (0.693)	2.526*** (0.900)	0.556*** (0.189)	-0.097 (0.259)
Ever Unincorporated	-2.799*** (0.520)	-3.885*** (0.586)	-0.513*** (0.119)	-0.555*** (0.148)
Incorporated		3.164*** (0.886)		1.304*** (0.356)
Unincorporated		2.448*** (0.556)		0.037 (0.212)
<i>% Difference from salaried workers</i>				
Ever Incorporated	16%	10%	3%	0%
Ever Unincorporated	-10%	-16%	-3%	-2%
Incorporated		13%		5%
Unincorporated		10%		0%
Observations	23675	23675	23675	23675
R-square	0.622	0.622	0.0738	0.0739

Note: This table reports OLS and median regressions for white males working full-time, full-year. The dependent variable is hourly earnings. 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. In regressions (2) and (4), the regression also includes Incorporated and Unincorporated, where Incorporated equals one in year  $t$  if the person is incorporated self-employed and zero otherwise; Unincorporated equals one in year  $t$  if the person is unincorporated self-employed and zero otherwise. 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 12: Annual Hours Worked and Earnings, NLSY79**

	<b>Means (OLS)</b>		<b>Medians (Quantile)</b>	
<b>Panel A: Annual Worked Hours</b>				
	(1)		(2)	
Incorporated	170.174*** (21.722)		75.021*** (10.222)	
Unincorporated	194.608*** (15.476)		147.328*** (6.630)	
<i>% Difference from salaried workers</i>				
Incorporated	0.07		0.03	
Unincorporated	0.08		0.06	
<b>Panel B: Annual and Hourly Earnings</b>				
	Hourly Earnings	Annual Earnings	Hourly Earnings	Annual Earnings
	(3)	(4)	(5)	(6)
Incorporated	4.384*** (1.407)	17446*** (3885)	1.147*** (0.252)	4579*** (650)
Unincorporated	0.739 (0.665)	5417*** (1809)	-0.450*** (0.165)	961** (426)
<i>% Difference from salaried workers</i>				
Incorporated	18%	29%	6%	9%
Unincorporated	3%	9%	-2%	2%
Observations	23657	23657	23657	23657

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 in panel (B). The OLS regressions include individual fixed effects. The median regressions 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 2,468 and 2,320 respectively, and the mean and median annual earnings of salaried workers are 50,867 and 49,220 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 13: The Change in Hourly Earnings by “Smart and Illicit,” NLSY79**

	By AFQT and Illicit		By Hourly Wage and Illicit	
	(1)	(2)	(3)	(4)
$\Delta$ Incorporated	0.192 (0.434)	1.360** (0.619)	0.074 (0.407)	1.791** (0.756)
$\Delta$ Unincorporated	-0.945*** (0.274)	-0.846 (0.570)	-0.595** (0.248)	-3.467*** (0.812)
<i>% Difference from salaried workers</i>				
Incorporated	1%	6%	0%	6%
Unincorporated	-5%	-3%	-3%	-11%
<b>Sample</b>				
<i>AFQT</i>	AFQT $\leq$ 50 or	AFQT $>$ 50	--	--
<i>Illicit Index</i>	Illicit $\leq$ 0	Illicit $>$ 0	Illicit $\leq$ 0 or Adj.	Illicit $>$ 0
<i>Adj. Wages</i>	--	--	Wages $\leq$ 0	Adj. Wages $>$ 0
Observations	13595	4459	13986	4068

Note: This table reports median regressions of the change in hourly earnings on the change in employment type for white males working full-time, full-year. The table provides results while differentiating between individuals above and below the average values of Illicit, AFQT, and Adjusted wages. Adjusted Wages are computed as the person fixed effect from a Mincerian log wage regression when people work as full-time, full-year salaried workers, where the wage regression is estimated over the full sample period. 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. AFQT is a measure of cognitive ability. Adjusted Wages are computed as the person fixed effect from a Mincerian log wage regression when people work as full-time, full-year salaried workers, where the wage regression is estimated over the full sample period. 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, experience and time effects. Standard errors are in parentheses. The symbols \*\*\*, \*\*, and \* signify significance at the one, five, and ten percent levels respectively.

Figure 1: The Incorporated Self-Employed 2, 4, 6, and 8 Years Later, NLSY79

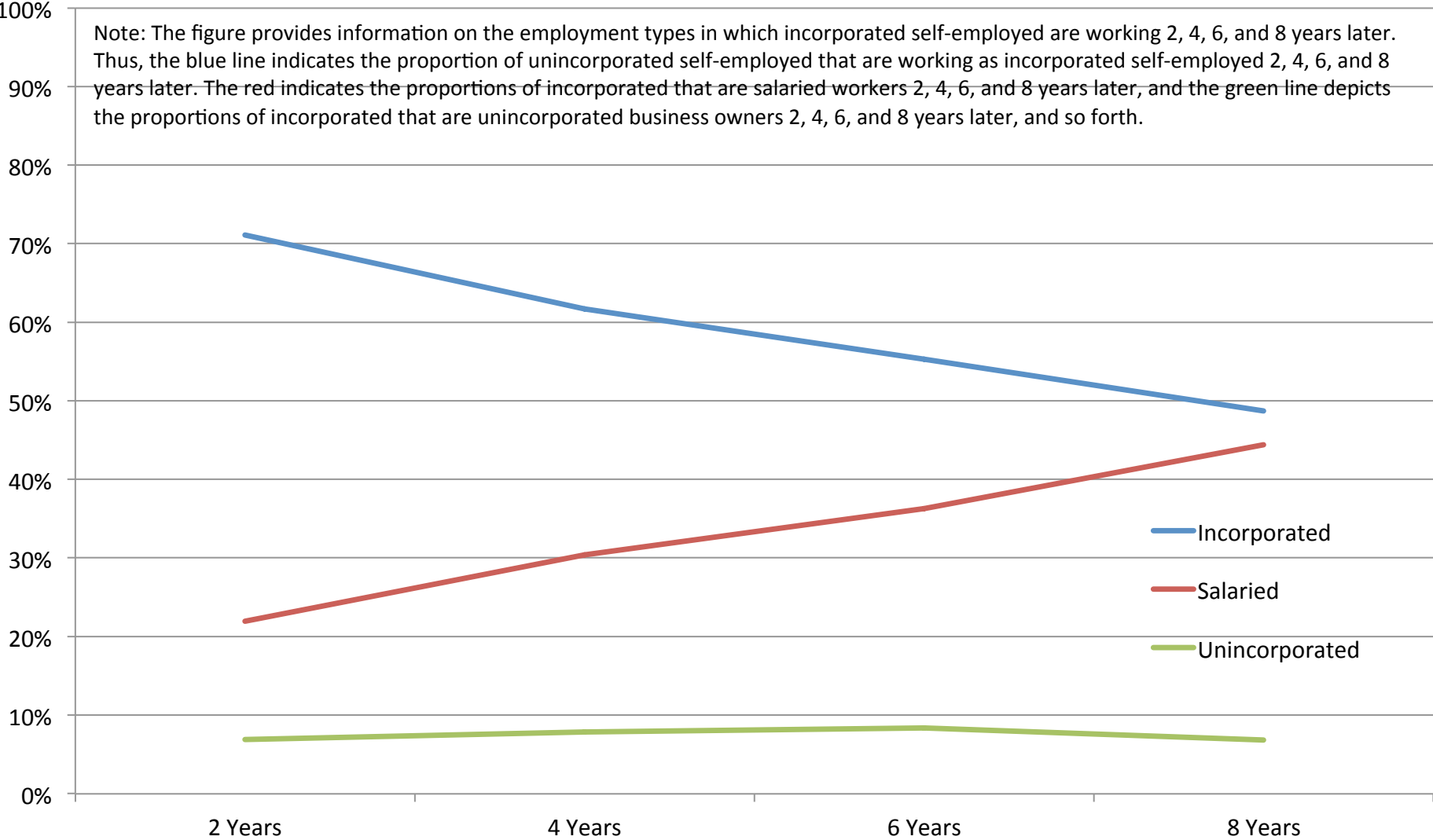


Figure 2: The Unincorporated Self-Employed 2, 4, 6, and 8 Years Later, NLSY79

