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Jobs Incorporated: Incorporation Status and Job Creation

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ABSTRACT

Recent research has shown that entrepreneurs who start incorporated firms are fundamentally different from entrepreneurs who start sole proprietorships. This difference suggests that incorporation status may distinguish the self-employed with no ambition to hire from entrepreneurs who plan to hire others. In this paper, we show that this intuition is correct. Using a dataset with over 24 million observations and more than 230,000 entries into entrepreneurship, we show that newly incorporated entrepreneurs create 50% more jobs than sole proprietors. The result derives from the fact that high-ability individuals are more likely to form incorporated ventures. While there is selection from both tails of the ability distribution into starting incorporated ventures—that is, both stars and misfits start corporations—it is primarily individuals with low ability, the misfits, who start sole proprietorships. This does not, however, mean that the aggregate number of jobs created by the incorporated is higher. Since more entrepreneurs in total become sole proprietors, the sole proprietors initially contribute more to aggregate job creation than the incorporated.

Keywords: Entrepreneurship, incorporation, job creation, occupational choice, self-employment, stars and misfits.

JEL Codes: L26, J24.

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1 Introduction

Over the past decade, policy makers have embraced entrepreneurship as an opportunity to create new jobs and wealth under ailing economic conditions. Indeed, recent studies of aggregate employment growth show that most new employment is created by young companies that start small, often in new industries (Anyadike-Danes et al., 2013; Haltiwanger et al., 2013; Heyman, et al., 2013).¹ A large portion of the recent shift in employment has thus been due to entrepreneurs.

Unfortunately, despite research, little robust information exists on the characteristics of entrepreneurs who create jobs (Parker, 2009).² For several reasons, some associated with a lack of data, it has been difficult to robustly identify any specific characteristics of entrepreneurs that distinguish between those who create jobs and those who do not.³

In addition, entrepreneurs are not a homogeneous group. Business ability among entrepreneurs shows large variations (e.g. Hall and Woodward, 2010), which are likely to affect variations in job growth in their new ventures. Furthermore, only a few entrepreneurs prefer to innovate and expand their firms, while a preponderance of business owners do not intend to expand their firms, preferring, instead, to remain small (Hurst and Pugsley, 2011). Indeed, research shows an apparent bimodal selection into entrepreneurship predominantly by those from the tails of the ability distribution (Andersson and Wadensjö 2013; Åstebro et al., 2011; Blanchflower, 2000, Elfenbein et al., 2010; Levine and Rubinstein, 2013; Ohyama, 2014; Poschke, 2013). In three recent studies, Andersson and Wadensjö (2013), Levine and Rubinstein (2013), and Tåg et al. (2014) distinguish between these two tails according to the legal form of the business when it was started—those who form sole proprietorships and those who form incorporated firms—and show that these two groups have different patterns of entry and earnings for individuals.⁴ The three studies find that individuals with

¹Haltiwanger et al., (2013, p. 348) writes: "Importantly, because new firms tend to be small, the finding of a systematic inverse relationship between firm size and net growth rates in prior analyses is entirely attributable to most new firms being classified in small size classes."

²Some argue that robust predictors regarding the characteristics of entrepreneurs are lacking mostly because of the effect on firm growth of chance and because little predictive information exists on post-entry firm growth from observable pre-entry entrepreneurial characteristics (e.g. Coad et al., 2013).

³Two recent exceptions are Herstad et al. (2013) and Huynh and Petrunia (2010).

⁴The sole proprietorship is a business owned and run by one person, in which there is no legal distinction between the owner and the business, and the owner pays personal income tax on profits from the business. The owner receives all profits (subject to taxation specific to the business) and has unlimited responsibility for all losses and debts. With little government regulation, they are the simplest business to set up or close down. For the purposes of this paper, incorporation involves limited liability and a separate legal identity with stricter reporting and auditing rules, and an upfront cash contribution of SEK 100,000 deposited into an escrow account. In addition, the corporations are "closely held", with at most four owners controlling at least 50% of the shares, and shares are not traded on an open

higher prior wages are substantially less likely to become sole proprietors and more likely to start an incorporated firm (Andersson and Wadensjö, 2013; Levine and Rubinstein, 2013; Tåg et al. 2014). Furthermore, Levine and Rubinstein (2013), find strong sorting into entrepreneurship based on a range of cognitive, noncognitive, and family traits, and discover that those who start incorporated firms earn significantly more than comparable wage earners, who, in turn, earn significantly more than those starting sole proprietorships.

If job creation is important, then knowing which entrepreneurs have the largest observable ability to expand their firm is critical. Because of the large proportion of jobs created by new firms, finding out whether certain types of entrepreneurs are more (or less) likely to create jobs than others is equally critical for both policy makers and those considering becoming entrepreneurs.⁵

Given the recent findings that entrepreneurs can be divided primarily into two groups—stars and misfits—and that they might be easily identified by the legal form of the business, we focus in this paper on the relation between the legal form of the start-up and the number of jobs created by them. We use data on all entrepreneurs in Sweden (subject to some constraints) between the ages of 20 and 60 who started new businesses during the period 2005 through 2009 to examine the extent of job creation two years, and for one cohort six years, after founding the firm. Our outcome data on job creation thus extends to 2011. As we identify all Swedish entrepreneurs, encompassing 38,836 new entries per year, we avoid the difficulties of identification based on small samples encountered in most previous studies.

Our primary contribution is showing that those who start incorporated ventures are substantially more likely to create jobs than those who start sole proprietorships. In fact, incorporation status dominates other observable individual characteristics in our dataset in its association with job creation.

In a multivariate regression, we find that the number of gross and net employees in the second year of operations is approximately 50% higher for an incorporated entrepreneur than for a sole proprietor. The gross employment created by the average sole proprietor, including him- or herself, is only 0.66 individuals two years after founding, while gross employment in incorporated firms is

exchange.

⁵Despite extensive efforts in recent years, it has been difficult to generate employment growth through policy initiatives directed at entrepreneurs. Several initiatives to stimulate job creation through entrepreneurship have been considered, such as allowing those coming from unemployment to collect unemployment insurance also as entrepreneurs for a transition period (e.g. Caliendo and Kritikos, 2011; Hombert et al., 2013).

2.48 employees. Excluding the entrepreneur, the average sole proprietor creates a minuscule 0.10 jobs for others, while the individual starting an incorporated firm hires 1.73 others over the same two-year period. Although these averages are surprisingly small, some entrepreneurs do manage to expand their firms to a decent size rather quickly but they are extremely few.⁶ For example, at the 99th (95th) percentile, and after two years, the incorporated create 20 (8) jobs. Among the sole proprietors, however there is almost no job growth, even at the top of the job creation distribution. Sole proprietors only create 3 (2) jobs after two years at the 99th (95th) percentile.

These differences persist in the medium term. Six years after starting the firm, the average sole proprietor still has created only 0.09 positions, while gross employment in incorporated firms has fallen to 0.46 employees. These data show that the job losses from the exit of unsuccessful new firms exceed the growth in the remaining successful firms, as found in general (Decker et al., 2014). Employment by incorporated firms at the bottom of the employer distribution thus falls over time while employment growth at the top of that distribution increases over time, leading to a bifurcation in job creation, while the distribution of employment growth for sole proprietors remains stagnant. In conclusion, the data on job growth present strong evidence that early considerations motivating the legal form chosen by entrepreneurs create persistent differences in job growth.

We then show that the results are driven by the selection of star entrepreneurs into incorporated ventures. While there is selection from both tails of the ability distribution into starting incorporated ventures—that is, both stars and misfits start incorporated firms—it is primarily individuals with low ability, the misfits, who start sole proprietorships. This does not, however, mean that the aggregate number of jobs created by the incorporated is higher. Since more entrepreneurs start sole proprietorships, the sole proprietorships initially contribute more to aggregate job creation than the incorporated firms, despite the absence of stars among sole proprietorships.

Our results on job creation are consistent with those of Levine and Rubinstein (2013) and others who find substantial differences in earnings between those who becomes sole proprietors and those who start incorporations. At some level, this is not surprising. As noted by Levine and Rubinstein (2013), the incorporated business form has two features that are particularly important for entrepreneurs who intend to expand: limited liability and legal separation of the individual

⁶The averages are smaller than reported in other studies because our study is able, for the first time, to include in the count those who do not employ anyone other than themselves.

entrepreneur from the company. Hiring others and entering into long-term employment contracts creates a risky commitment, since the future direction of the company is often uncertain. Both features of the incorporated business form are thus desirable to mitigate the risks of personal liability for the entrepreneur when hiring others.

In terms of policy, we end with a rather skeptical view of the utility of measuring outcomes such as earnings and job creation by the legal form of the firm because it is not predetermined. The legal form is a choice by the entrepreneur, not a cause of job creation in itself. Thus, for example, trying to encourage entrepreneurs to create incorporated firms using monetary incentives is likely to have perverse effects in terms of attracting the lower-performing entrepreneurs to form incorporated firms. Nevertheless, our results are still highly useful for researchers interested in obtaining a better proxy for true entrepreneurship in the sense of the entrepreneur creating more gross and net jobs.

The roadmap reads as follows. The next section lays out our empirical approach. Section 3 describes the data and summary statistics. Section 4 provides the main results of the paper on job creation by incorporation status. Section 5 examines selection into incorporation status by ability, and Section 6 studies economywide total job creation by incorporation status. We summarize the paper and provide a discussion of the implications of our results in section 7.

2 Empirical Approach

We follow the definition used by Statistics Sweden in defining entrepreneurs. Statistics Sweden defines an individual as being employed in her own firm in a given year if her total income from her own company (labor and capital income) is more than 62.5 percent of income from all labor. Using this definition, one excludes as entrepreneurs those with a secondary source of income who remain employed by someone else and the majority of whose earnings come from that employment. This definition significantly reduces the number of entrepreneurs compared to, for example, counting those who report earning any income from a business they own or counting those who are simply registered as owning a business.⁷ We further define an individual as entering entrepreneurship in any given year if the following criteria are simultaneously fulfilled:

⁷See Bjurgren, Johansson and Stenkula (2012) for a detailed discussion of the entrepreneurship definition used by Statistics Sweden (and this paper).

1. *Occupied in own business.* An individual is classified by Statistics Sweden as working in her own company in the current year.
2. *New place of work.* The individual’s current firm and establishment identifiers are different from those of the previous year, and
3. *New firm.* No individual in our sample worked for the firm in the previous year.

Criterion 1 states that Statistics Sweden identified an individual as being an entrepreneur, criterion 2 ensures that the individual moved into entrepreneurship, and criterion 3 attempts to ensure that the firm is entirely new. Criterion 3 is also imposed to remove hires at existing firms that obtain an ownership stake in connection with being hired. Using this definition, we calculate 233,014 entrepreneurs between 2005 and 2009. As already discussed, using this definition of entry into entrepreneurship excludes part-time (“hybrid”) entrepreneurs, such as those who have a regular job while operating a consulting business on the side. We consider such part-time entrepreneurs unimportant in terms of job creation. Our definition of entry into entrepreneurship also excludes individuals who start a business in which they do not work for themselves and thus do not satisfy the criterion of earning at least 62.5 percent of all labor income from their own firm. This measure therefore excludes jobs created at firms where all owners are silent owners. We are rather confident that a multi-owner firm with silent owners is likely to have at least one owner-partner employed in the business, and job creation will then be counted through that person’s record of entrepreneurship, although we cannot be sure that we capture all those firms. It is also useful for our purposes that Statistics Sweden distinguishes between incorporated firms and sole proprietorships.

To measure gross employment, we use the number of employees, including owners, two years after the firm’s founding and divide by the number of entrepreneur-owners at the firm at founding. Specifically, at time $t + x$ gross employment equals:

$$G_{t+x} = \frac{E_{t+x}}{F_t} \quad (1)$$

where G_{t+x} is gross jobs at $t + x$, E_{t+x} is employment at the firm at $t + x$, F_t is the number of founding entrepreneurs, and x measures the number of years since founding. Thus, $x = 0$ is the first year of operation of the business, and we use $x = 2$ in our main specifications.

We further want to analyze the impact of entrepreneurial characteristics on job creation for others. If an individual simply leaves an employer and starts his own firm, then there is no new job creation. We therefore analyze net job creation in the following way. Net jobs measures employment growth in the firm two years after founding while subtracting the number of entrepreneurs at the firm at founding. Specifically, at time $t + x$ net employment equals:

$$N_{t+x} = \frac{E_{t+x} - F_{t+x}}{F_t} \quad (2)$$

where N_{t+x} is net jobs at $t + x$, E_{t+x} is employment at the firm at $t + x$, F_{t+x} is the number of entrepreneurs at the firm at $t + x$, F_t is the number of founding entrepreneurs, and x measures the number of years since founding.

If the firm closes prior to $t + x$, we set both measures at zero.⁸ It is entirely possible that a firm may experience gross/net job losses of less than 1 prior to $t + x$. For example, let us assume that a firm is started by two entrepreneurs, and they hire one employee. However, only one entrepreneur and no other employee remain employed at the firm at $t+2$. Gross jobs are thus $G_{t+2} = 1/2 = 0.5$, and net jobs $G_{t+2} = (1 - 1)/2 = 0$. Finally, note that we measure gross and net employment on a per-founder basis. That is, we divide each measure by the number of founders at each firm at creation. This allows us to compute job creation by each original founder.

The number of created jobs is left censored at zero and subject to a high degree of skew. As a consequence, ordinary least squares (OLS) regression at sample mean values may provide biased estimates. A standard approach, which we employ, is to take the logarithm to reduce the skew and proceed with OLS. That is, our regressions on gross jobs (and for net jobs) take the form:

$$\log(1 + G_{t+2}) = \alpha + \beta INC_{it} + \gamma x_{it-1} + \theta_t + \epsilon_{it} \quad (3)$$

where INC_{it} is a dummy for incorporation status and x_{it-1} contains demographic characteristics, educational attainment characteristics, labor market outcome characteristics, and employer characteristics for individual i at time $t - 1$ (including industry and region dummies). Year dummies

⁸More precisely, after a firm is duly registered as founded according to our prior stated definition, if no individual in Sweden either was recorded as owning the firm or obtained his or her primary source of income from the firm at $t + x$, we set both gross and net jobs in year $t + x$ at zero.

are represented by θ_t . We also perform quantile regressions to examine the distribution of the parameter INC_{it} across the job creation distribution.

3 Data and Summary Statistics

Table 2 provides summary statistics for the full sample (column 1), those not entering entrepreneurship (column 2), and those entering entrepreneurship (column 3). The table also shows characteristics for those entering entrepreneurship as sole proprietors (column 4) and as incorporated (column 5).⁹ Our sample represents all individuals living in Sweden between the ages of 20 and 60 and contains over 24 million individual-year observations. In terms of entrepreneurship, the rate of entry is approximately 1 percent per year for all individuals. The entry rate is somewhat smaller than in other studies because our definition of entrepreneurship is rather stringent and because we examine entry as a fraction of all individuals in Sweden between the ages of 20 and 60, not just as a fraction of the working population. Of those entering entrepreneurship, 16.1% choose to incorporate.

There are rather large differences in observable characteristics between those who choose to start a sole proprietorship and those who choose to incorporate. Those who do not incorporate tend to be less educated; earn less as employees; are more likely to be female, unemployed, or out of the labor force; and are less likely to be an entrepreneur (of any kind) in the year prior to entering entrepreneurship.

Aside from the large differences between those who start incorporated firms and those who start sole proprietorships, there are also large differences in their firms' outcomes. Table 3 shows the distributions of gross and net jobs two and six years after founding a sole proprietorship or incorporated business. Panels A and B display the distributions overall, while Panels C and D show distributions conditional on survival at $t + 2$ and $t + 6$ respectively. Panel C and D also display total earnings that accrue to the entrepreneur conditional on business survival.

This table reports strikingly large differences in gross and net job creation between the sole proprietors and the incorporated entrepreneurs. Panel A shows that the gross employment created by the average sole proprietor, including him- or herself, is only 0.66 individuals two years

⁹Variable descriptions are available in Table 1.

after founding, while gross employment in incorporated firms is 2.48 employees. Excluding the entrepreneur, the average sole proprietor creates a minuscule 0.10 jobs while the individual starting an incorporated firm hires 1.73 others over the same two-year period. Although these averages are surprisingly small, some entrepreneurs do manage to expand their firms to a decent size rather quickly, but they are extremely few. After two years, at the 99th (95th) percentile the incorporated entrepreneurs create 20 (8) jobs. Among the sole proprietors, however, there is almost no job growth. Even at the 99th (95th) percentile, sole proprietors only create 3 (2) jobs.

These differences persist in the medium term. Panel B shows that six years after the firm has opened, the average sole proprietor has created only 0.09 jobs, while gross employment in incorporated firms has fallen to 0.46 employees. These data show that the job losses from the exit of unsuccessful firms exceed the growth in the remaining successful firms. The patterns are consistent with those found in the United States (see, e.g., Decker et al., 2014). For the surviving firms, job creation is, of course, larger. Panel C shows that sole proprietorships that survive at $t + 2$ tend to have 1.2 employees while incorporated firms have 3.1 employees. Two years out, and at the 99th percentile, firm size for the sole proprietorships is 4 and for the incorporated firms is 23. Six years out, Panel D shows that the sole proprietorships employ 1.2 individuals and the incorporated firms 4.1 individuals at the mean, and 5 and 34 individuals respectively at the 99th percentile. Thus, employment by incorporated firms at the bottom of the employer distribution falls over time, and employment growth at the top of that distribution increases over time, leading to a split in job growth. The distribution of employment growth at sole proprietorships remains stagnant.

Our supporting data on private earnings show an even stronger split between sole proprietors and incorporated entrepreneurs in Sweden than in the United States. Panel C shows that the personal earnings for those starting incorporated firms and surviving for two years are eight times higher, on average approximately \$48,000, versus \$6,000 for sole proprietors (2005 values, \$1 = SEK 7.5).¹⁰ Furthermore, 50% of all sole proprietors earn zero or less, while even at the bottom 25% of the earnings distribution, owners of incorporated firms earn \$25,000. The differences in

¹⁰In the United States, the median of total income for all owners of incorporated firms is only twice as high as that for all sole proprietors (Levine and Rubenstein, 2013). In Sweden, the median sole proprietor (independent of year of operations) earns zero total income (a mean of SEK 42,800) and the median incorporated entrepreneur SEK 293,560 (a mean of SEK 397,670).

pre-entry earnings for the two entry groups displayed in Panel D of Table 2 are somewhat smaller, but still highly indicative. Those who start sole proprietorships earn on average \$14,800 before entry, while those who become owners of incorporated firms earn on average \$33,900, or more than twice as much, before entry.

4 Gross and Net Job Creation

We now move on to the main results of our study, the effect of incorporation status on gross and net job creation. The next set of regressions thus analyzes the log of the number of jobs created, in which firms that closed during that period are counted as having contributed zero jobs. The coefficient can thus be directly interpreted as the percentage change in the number of jobs created by an entrepreneur in two years' time at the mean of the distribution.

Table 4 displays the results from the model presented in equation 3.¹¹ Columns 1-2 show the effects on gross and net jobs from a regression including only year fixed effects and the incorporation status dummy. Columns 3-4 add industry and location fixed effects, and columns 5-6 individual-level controls from Table 2. The final column displays regressions on gross and net jobs at $t + 6$ instead of $t + 2$ and thus restricts the sample to $t = 2005$. Incorporation status is a strong correlate of the average gross and net job creator. The number of gross and net employees in the second year of operations is approximately 50% higher for an incorporated firm than a sole proprietorship. Note that most often no major difference exists between the coefficients for gross and net job creation, indicating that job growth occurs primarily among non-owner employees. Moreover, adding controls has almost no effect on the size of the coefficient for incorporation status, and the explanatory power of the model, the R^2 , changes very little when we include controls that typically tend to predict entrepreneurship entry.¹²

Columns 7 and 8 show that the coefficients for incorporated firms surprisingly maintain the same level after six years as they do after two years of operations, 47% to 48%. Even though one

¹¹Note that almost all coefficients are significant, which is due to the large size of the sample. All the coefficients not displayed are also smaller in effect size than the coefficient for incorporated firms by a wide margin.

¹²In unreported regressions, we have also included year times industry fixed effects, which results in unchanged coefficients on the incorporated firm dummy. We also ran the regressions restricting the sample to only males and additionally ran them separately for each industry. The results remain similar in these subsamples, with the number of gross and net employees in the second year of operations being between 49%-60% higher for an incorporated firm than a sole proprietorship.

would expect to find considerably more random variation in the data when predicting what will happen six years into the future instead of two, it turns out that the legal form of the firm as well as other coefficients together explain about as much variation in six years as in two years. The R^2 for the regressions two years out is between 0.15 and 0.22, while six years out it is between 0.12 and 0.20.

We also ran quantile regressions on gross job creation (unreported) to investigate whether the more rapidly growing start-ups are more likely to be found among incorporated firms. We run quantile regressions for the median, the 75th-, 95th-, and 99th-percentile job creators. The median effect for incorporation status is 0.35, while the 75th percentile is estimated at 0.59, the 95th at 1.21, and the 99th at 1.62. This suggests that most of the gross and net job creation at the tails takes place in incorporated firms.

5 Selection and Incorporation Status

Table 2 clearly highlights that entrepreneurs who incorporate tend to be fundamentally different from those who do not, across several pre-entry characteristics. Moreover, Table 4 shows that those who incorporate also tend to create many more gross and net jobs. We next document that those who incorporate tend to be drawn from both the top and the bottom parts of the ability distribution, whereas those who start sole proprietorships tend to be drawn from the bottom part of the ability distribution only. In effect, both stars and misfits incorporate but only the misfits start sole proprietorships.¹³

To examine the conditional probability of forming a corporation versus a sole proprietorship as a function of the location in the ability distribution, we use a multinomial logit model with three outcomes: being in salaried employment at $t = 0$, entering as sole proprietor at $t = 0$, and entering as incorporated at $t = 0$.¹⁴ Table 5 displays the output. We include a battery of controls in the

¹³It is worth noting that this pattern is not exactly the same as that documented by Andersson and Wadensjö (2013) for male Swedes entering entrepreneurship in 2001 from salaried employment. Andersson and Wadensjö, in contrast to the present authors, find that entry from both tails of the labor income distribution happens mostly among sole proprietors. Possible explanations for this divergence in results is that our data cover a longer time period, includes females, those outside the labor force, and the unemployed, and pools the incorporated, who start businesses that employ others (positive net jobs), with the incorporated, who do not do so (zero net jobs).

¹⁴We drop observations with other outcomes at $t = 0$. In unreported regressions, we obtained similar results if we also included moves to unemployment and moves to “other” (such as going abroad and leaving the labor force) as potential outcomes and if we run the regressions only on the sample of salaried workers at $t = -1$.

regressions and focus on earned labor income as our ability measure. The table shows differential entry patterns into forming sole proprietorships versus forming corporations, depending on the pre-entry location of an entrepreneur in the labor income distribution. Individuals at the tails of the labor income distribution are more likely to start incorporated firms than the individuals in the middle of the labor income distribution.

For example, the probability of starting an incorporated firms is 80% higher for those at the 90th percentile, and 124% higher at the 10th percentile, than for those at the 50th percentile. However, the higher up an individual is in the labor income distribution, the lower is the probability of forming a sole proprietorship. For example, those at the 90th percentile are 64% less likely to become a sole proprietor than those at the 50th percentile. This pattern suggests that the large coefficients on the incorporation dummy in the job creation regressions could be driven by the fact that high-ability individuals are more likely to form corporations. While there is selection from both tails of the ability distribution into starting incorporated ventures—that is, both stars and misfits start corporations—primarily individuals with low ability, the misfits, start sole proprietorships.

To investigate this selection issue further, we revisit the job creation regression, but this time run regressions that omit the incorporation status dummy. Columns 1 and 2 in Table 6 display the coefficients for the labor income deciles from this regression. As expected, both more gross and net jobs are created by individuals higher up in the labor income distribution. Columns 3 and 4 then reintroduce the incorporation status dummy. Two observations emerge. First, all coefficients for labor income are considerably reduced in size. For example, the coefficients on deciles between the 60th and 90th percentile are no longer statistically significant. Second, the R^2 of the regressions increases by around 300%. These findings indicate that ability affects both gross and net job creation through incorporation choice, but that incorporation status also includes other omitted controls, such as a preference for staying small and perhaps an idiosyncratic business opportunity, that are associated with job creation.

6 Total Gross and Total Net Job Creation

We now continue with our analysis of the 2005 cohort and ask: in the aggregate, which create more jobs: sole proprietors or incorporated entrepreneurs? The answer is not straightforward. Although

we have shown that incorporated firms create more jobs, more entrepreneurs in the aggregate enter as sole proprietors. The total number of jobs created in the economy may therefore be higher for sole proprietors than for those starting incorporated firms.

Figure 1 is informative in answering this question. This figure displays gross and net job creation for new ventures created in 2005 divided by incorporation status. The top two figures shows mean gross and net jobs in the firms *conditional on survival* for $t = 0$ to $t = 6$. The bottom two figures show the economywide sums of gross jobs and of net jobs created by new businesses started at $t = 2005$ for $t + 0$ to $t + 6$. The two top figures displaying mean job creation conditional on survival shows what we have found earlier: jobs are more plentiful and their number grows more rapidly in incorporated firms than in sole proprietorships, in both gross terms (top left) and net terms (top right). The mean size of a surviving incorporated firm at $t + 6$ is 4, whereas it is only slightly above 1 for sole proprietorships.

As shown by the bottom two figures, however, the aggregate gross number of jobs created by sole proprietors is consistently higher than the aggregate gross number of jobs created by incorporated firms. But there is a downward trend among sole proprietorships that is not present for incorporated firms. Six years out, the aggregate gross number of jobs created by both sole proprietors and entrepreneurs forming corporations in the 2005 cohort is around 20,000. The bottom right figure, in combination with the top two figures, clearly shows that this is driven by the fact that sole proprietors stay small and tend not to hire anyone beyond the founders, whereas the incorporated firms tend to hire other employees.

7 Concluding Remarks

This paper looks at job creation by entrepreneurs and incorporation status. The gross employment created by the average sole proprietor, including him- or herself, is only 0.66 individuals two years after the firm is founded, while gross employment in incorporated firms at that time is 2.48 employees. At the 99th percentile, sole proprietorships create 3 jobs, while the incorporated firms create 20 jobs in two years' time.

These figures are lower than typical job creation numbers reported in the past, because most prior studies have been forced to examine job creation among registered employers (see, e.g., Halti-

wanger et al., 2013), which by definition must employ at least one person, thereby inflating true employment numbers. However, our gross employment data seem to stack up well compared to calculations on employment at all kinds of U.S. start-ups by Scott Shane (Shane, 2008, p. 65).¹⁵ Another attempt to avoid the inflationary problem in official U.S. employment data was made by Hurst and Pugsley (2011). They use the Kauffman Firm Survey (KFS) to show that, among surviving start-ups of all kinds, after four years, 41.9% had hired more than one employee, and 3.6% had hired more than ten employees. Using our data, we find that only 21.2% had hired more than one employee, and only 1.4% had hired more than ten employees.

Including all types of entrepreneurs in calculating job creation rates thus significantly reduces our estimation of how many jobs are actually created by the typical entrepreneur. Our paper is among the first to show an unbiased assessment of the number of employees and job growth in all start-ups in an economy. It may appear from our analysis that job creation by entrepreneurs in Sweden is either of comparable magnitude to those in U.S. data or generated less employment than those in the United States¹⁶ Nevertheless, as stated above, among the very top percentiles of those forming incorporated firms, there are some high-level job creators.

Our major contribution is showing that incorporation status is highly correlated with the creation of both gross and net jobs, in both the short and the long run. This is useful for researchers interested in obtaining a better proxy for true entrepreneurs with growth intentions (i.e., the focus should be on those with incorporated businesses). However, using this information to infer that encouraging entrepreneurs to create incorporated firms will stimulate job creation is likely to backfire. Such stimulation is bound to have perverse effects in terms of attracting the worse-performing entrepreneurs to form incorporated firms for no reason other than to obtain the incentives. Interestingly, in 2010 the Swedish government implemented a law that lowered the requirement for the amount of capital held in escrow by those forming an incorporated firm by 100% with the express purpose of stimulating job growth. Future research will have to show the impact of this policy

¹⁵Shane (2008, p. 65) reports studies showing that the average new firm in the United States with at least one employee had 3.8 employees. Because the number of new businesses without any employees in the United States is about 76 percent, Shane extrapolates and states that "the average start-up in the United States begins with 1 employee, including the founder." The average employment size at $t+2$ in our dataset is the same: 1.

¹⁶Unfortunately, the KFS does not properly represent all U.S. firms, so a representative analysis of the United States using the KFS is not possible. An official description of the KFS states: "The study created the panel by using a random sample from the Dun & Bradstreet (D&B) database list of new businesses started in 2004. In response to the Foundation's interest in understanding the dynamics of high-technology businesses, the KFS oversampled these businesses based on the intensity of research and development employment in the businesses' primary industries."

change.

Nevertheless, there are likely to be labor market failures that prohibit the best allocation of talent to the most suitable jobs. Åstebro et al. (2011) indicate that labor market frictions are a strong determinant of entrepreneurship and that these are driving the bimodal pattern of entry, with stars entering from the upper tail of the ability distribution (and predominantly forming corporations) and misfits entering from the bottom of the ability distribution (and most often forming sole proprietorships). If labor market frictions were the only cause of entrepreneurship, it would be possible to use the level of entry from the tails of the ability distribution as a measure of the lack of job matching in the labor market. Using this lens, higher levels of entry at the tails would indicate greater market failure, signaling the need for more government intervention to reduce job-matching frictions. Reducing job-market frictions would reduce inefficient allocation of talent to entrepreneurship.

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Table 1: Variable Definitions

This table displays descriptions of the variables that we use from the Statistics Sweden’s LISA database. Our final dataset uses data from Statistics Sweden for $t = 2005$ to $t = 2009$ for everyone in Sweden between 20 and 60 years old unless otherwise noted. The Swedish Secrecy Act protects access to the data from Statistics Sweden, but researchers affiliated with a Swedish research institution can apply for access. A full detailed description of the variables in LISA is available from the Statistics Sweden homepage (scb.se). An individual’s main source of income in November in each year is the base for the majority of the employer-employee links in LISA. Information on all variables below is close to complete for the population of individuals living in Sweden unless otherwise noted.

Panel A: Demographic Characteristics	
Individual Identifier	Original source is social security numbers from the population registry.
Gender	Original source is the population registry.
Educational Attainment	Information on highest completed education level comes from the Education Register at Statistics Sweden (Utbildningsregistret). The education level variable takes the values: (6) postgraduate education, (5) post-secondary education (two years or longer), (4) post-secondary education (less than two years), (3) upper secondary education, (2) primary and lower secondary education (9 or 10 years), and (1) primary and lower secondary education (less than 9 years).
Panel B: Labor Market Outcomes	
Labor Market Status	We classify workers in one of five categories based on employment and unemployment information from Statistics Sweden: (1) employed, (2) unemployed, (3) sole proprietor, (4) incorporated entrepreneur, and (5) other. The other category includes those outside the labor force (for example, students).
Labor Market Experience	Calculated as the number of years since an individual last obtained a degree from a school based on data from the Education Register at Statistics Sweden. For those without a degree, we calculate it as $age - 19$ if attended upper secondary school (“High School”) and $age - 16$ if attended primary or lower secondary education or below.
Labor Income	Original source is Swedish Tax Office records. Labor income refers to total gross annual labor income in thousands of 2005 SEK from all sources.
Tenure	We calculate the tenure of a worker based on observing worker-firm links from 1990 onward. We include a truncation dummy to account for not observing information before 1990.
Sector	Employer sector of operation classification. We use the SNI2002 classification and map the SNI1992 and SNI2007 to SNI2002 for years the SNI2002 classification is not available. We then aggregate industries to seven sectors: (1) manufacturing, (2) wholesale and retail, (3) real estate, renting, and business activities, (4) education, (5) health and social work (6) other, and (7) worker not employed.
Geographic Location	Employer geographic location. We use the NUTS2 region coding provided by Statistics Sweden. The regions are: (1) Stockholm, (2) Östra Mellansverige, (3) Småland med Öarna, (4) Sydsverige, (5) Västsverige, (6) Norra Mellansverige, (7) Mellersta Norrland, (8) Övre Norrland, and (9) worker not employed.

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Panel C: New Business Characteristics

Entrepreneurship Entry	Entrepreneurship entry takes the value one for individuals switching to entrepreneurship and zero otherwise. We rely on the entrepreneurship classification provided by Statistics Sweden to construct this dummy. See section 2 for additional details.
Incorporation Status	A dummy based on entrepreneurship type provided by Statistics Sweden. Takes the value one for entrepreneurs running incorporated firms and the value zero for sole proprietorships.
Gross Jobs at $t + x$	For entrepreneurs entering entrepreneurship at time t , gross employment equals $G_{t+x} = \frac{E_{t+x}}{F_t}$ where G_{t+x} is gross jobs at $t + x$, E_{t+x} is employment in the firm at $t + x$, F_t is the number of founding entrepreneurs, and x measure years since founding. For businesses not in operation, gross jobs at $t + x$ equals zero. See section 2 for additional details.
Net Jobs at $t + x$	For entrepreneurs entering entrepreneurship at time t , net employment equals $N_{t+x} = \frac{E_{t+x} - F_{t+x}}{F_t}$ where N_{t+x} is net jobs at $t + x$, E_{t+x} is employment in the firm at $t + x$, F_{t+x} is the number of entrepreneurs in the firm at $t + x$, F_t is the number of founding entrepreneurs, and x measure years since founding. For businesses not in operation, net jobs at $t + x$ equals zero. See section 2 for additional details.
Total Earnings at $t + x$	For entrepreneurs entering entrepreneurship at time t , total earnings at time $t + x$ equals the sum of annual labor and capital income at $t + x$ if the business is in operation in the sense that it has at least one employee (including the founders). For businesses not in operation, total earnings at $t + x$ equals zero.

Table 2: Summary Statistics on Pre-entry Characteristics

This table displays summary statistics for $t - 1$ on the full sample (column 1), those not entering entrepreneurship at t (column 2), those entering entrepreneurship at t (column 3), those entering as sole proprietors (column 4), and those entering as incorporated (column 5). Variable descriptions are available in Table 1.

	Full Sample (1)	No Entry (2)	Entry (3)	Sole Proprietors (4)	Incorporated (5)
Observations	24,476,848	24,243,834	233,014	195,511	37,503
Entering Entrepreneurship	0.95%	0%	100%	83.9%	16.1%
Panel A: Demographic Characteristics					
Female	0.492	0.493	0.359	0.385	0.219
Educational Attainment					
- $i9y$	0.038	0.038	0.034	0.038	0.015
- 9-10y	0.108	0.108	0.110	0.113	0.092
- Upper secondary	0.488	0.488	0.489	0.493	0.472
- Post-secondary ($2y_i$)	0.071	0.071	0.083	0.080	0.098
- Post-secondary ($i=2y$)	0.270	0.270	0.261	0.252	0.307
- Post-graduate	0.009	0.009	0.008	0.007	0.012
- Not available	0.016	0.016	0.015	0.017	0.005
Panel B: Labor Market Characteristics					
Labor Market Status					
- Employed	0.765	0.767	0.620	0.621	0.617
- Unemployed	0.057	0.056	0.094	0.106	0.035
- Entrepreneur (Sole Proprietor)	0.042	0.042	0.079	0.067	0.142
- Entrepreneur (Incorporated)	0.026	0.026	0.045	0.027	0.143
- Other	0.109	0.109	0.161	0.180	0.064
Labor Income	199.644	200.272	134.273	111.253	254.282
Tenure	4.059	4.082	1.722	1.541	2.665
Industry					
- Manufacturing	0.125	0.126	0.070	0.068	0.080
- Wholesale and Retail	0.095	0.096	0.083	0.074	0.132
- Real Estate, Renting, and Bus. Act.	0.105	0.105	0.124	0.101	0.240
- Education	0.065	0.065	0.039	0.042	0.022
- Health and Social Work	0.174	0.175	0.073	0.077	0.047
- Other	0.210	0.210	0.231	0.227	0.250
- Not Employed	0.225	0.223	0.381	0.410	0.229
Location					
- Stockholm	0.235	0.235	0.219	0.206	0.286
- Östra Mellansverige	0.111	0.111	0.079	0.074	0.105
- Småland med Öarna	0.064	0.064	0.046	0.043	0.059
- Sydsverige	0.096	0.096	0.079	0.077	0.088
- Västsverige	0.149	0.150	0.115	0.110	0.141
- Norra Mellansverige	0.061	0.061	0.043	0.041	0.053
- Mellersta Norrland	0.028	0.028	0.023	0.022	0.025
- Övre Norrland	0.037	0.037	0.025	0.024	0.033
- Not Employed	0.219	0.218	0.371	0.402	0.210

Table 3: Summary Statistics on Outcomes

This table displays summary statistics on gross jobs, net jobs, and total earnings accruing to the founder two years after founding ($t + 2$) a business. Variable descriptions are available in Table 1. Panel A displays outcomes unconditional on survival, i.e. the outcomes takes value zero if the business has no employees (including the founder) at $t + 2$. Panel B displays outcomes conditional on survival, i.e. outcomes for the firms that have employees (including the founder) at $t + 2$.

	Mean (1)	SD (2)	P25 (3)	Median (4)	P75 (5)	P95 (6)	P99 (7)
Panel A: Outcomes at $t + 2$							
Unincorporated (N=195511)							
- Gross jobs	0.656	0.857	0.000	1.000	1.000	2.000	3.000
- Net jobs	0.105	0.633	0.000	0.000	0.000	1.000	2.500
Incorporated (N=37503)							
- Gross jobs	2.477	5.681	1.000	1.000	2.500	8.000	20.500
- Net jobs	1.725	5.403	0.000	0.000	1.500	7.000	19.333
Panel B: Outcomes at $t + 6$ for the 2005 Cohort							
Unincorporated (N=195511)							
- Gross jobs	0.091	0.397	0.000	0.000	0.000	1.000	1.000
- Net jobs	0.017	0.245	0.000	0.000	0.000	0.000	0.000
Incorporated (N=37503)							
- Gross jobs	0.459	3.554	0.000	0.000	0.000	2.000	9.000
- Net jobs	0.362	3.463	0.000	0.000	0.000	1.000	8.000
Panel C: Outcomes Conditional on Survival at $t + 2$							
Unincorporated (N=108909)							
- Gross jobs	1.178	0.839	1.000	1.000	1.000	2.000	4.000
- Net jobs	0.189	0.839	0.000	0.000	0.000	1.000	3.500
- Total earnings	43.569	2196.175	-14.321	-0.094	16.297	183.234	599.720
Incorporated (N=29861)							
- Gross jobs	3.111	6.210	1.000	1.500	3.000	9.000	23.000
- Net jobs	2.166	5.976	0.000	1.000	2.000	8.000	22.000
- Total earnings	361.100	598.477	187.028	289.034	412.030	809.055	1714.548
Panel D: Outcomes Conditional on Survival at $t + 6$ for the 2005 Cohort							
Unincorporated (N=14642)							
- Gross jobs	1.213	0.864	1.000	1.000	1.000	2.000	5.000
- Net jobs	0.224	0.869	0.000	0.000	0.000	1.000	4.000
- Total earnings	32.954	299.129	-17.738	-0.450	17.198	202.863	657.212
Incorporated (N=4167)							
- Gross jobs	4.130	9.926	1.000	2.000	4.000	13.000	34.000
- Net jobs	3.257	9.927	0.000	1.000	3.000	12.000	34.000
- Total earnings	396.715	584.248	194.940	308.482	455.069	889.789	2319.557

Table 4: Job Creation and Incorporation Status

This table displays the output from OLS regressions on the log of gross jobs at $t + 2$ and the log of net jobs at $t + 2$ corresponding to the model in equation 3. Columns 7-8 refers to regressions on the log of gross jobs at $t + 6$ and the log of net jobs at $t + 6$. Variable descriptions are available in Table 1. Individual controls include gender, education, labor market status, labor market experience (plus its square), dummies for each year of tenure for the employed, and decile dummies for labor income. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	All years ($t + 2$)		All years ($t + 2$)		All years ($t + 2$)		All years ($t + 6$)	
	Gross Jobs (1)	Net Jobs (2)	Gross Jobs (3)	Net Jobs (4)	Gross Jobs (5)	Net Jobs (6)	Gross Jobs (7)	Net Jobs (8)
Incorporation Status	0.490*** (0.00377)	0.510*** (0.00397)	0.485*** (0.00380)	0.504*** (0.00397)	0.493*** (0.00392)	0.502*** (0.00400)	0.470*** (0.0103)	0.493*** (0.00981)
Characteristics at $t - 1$								
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Location FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Individual Controls	No	No	No	No	Yes	Yes	Yes	Yes
Observations	233,014	233,014	233,012	233,012	233,012	233,012	44,890	44,890
R^2	0.131	0.200	0.136	0.205	0.147	0.219	0.122	0.198

Table 5: Multinomial Logit for Entry

This table displays the output from a multinomial logit model with three outcomes: in salaried employment at $t = 0$ (omitted), entering as a sole proprietor at $t = 0$ (column 1) and entering as incorporated at $t = 0$ (column 2). Observations with other outcomes at $t = 0$ are dropped. Variable descriptions are available in Table 1. Individual controls include gender, education, labor market status, labor market experience (plus its square), and dummies for each year of tenure for the employed. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	Unincorporated (1)	Incorporated (2)
Labor Income Decile at $t - 1$		
Below 10th	2.816*** (0.0152)	1.310*** (0.0350)
10th-20th	2.450*** (0.0117)	1.090*** (0.0382)
20th to 30th	1.408*** (0.00944)	1.100*** (0.0226)
30th to 40th	0.733*** (0.00912)	0.316*** (0.0243)
40th to 50th	(Omitted)	(Omitted)
60th to 70th	-0.538*** (0.0126)	-0.137*** (0.0266)
70th to 80th	-0.669*** (0.0129)	0.0395 (0.0243)
80th to 90th	-0.833*** (0.0133)	0.200*** (0.0227)
Above 90th	-0.974*** (0.0132)	0.553*** (0.0211)
Other Characteristics at $t - 1$		
Year FE	Yes	Yes
Industry FE	Yes	Yes
Location FE	Yes	Yes
Individual Controls	Yes	Yes
Observations	17,814,490	17,814,490

Table 6: Job Creation and Ability

This table displays the output from OLS regressions on the log of gross jobs at $t + 2$ and the log of net jobs at $t + 2$ corresponding to the model in equation 3. Variable descriptions are available in Table 1. Individual controls include gender, education, labor market status, labor market experience (plus its square) and dummies for each year of tenure for the employed. Robust standard errors in parentheses. *** p_i0.01, ** p_i0.05, * p_i0.1.

	All years ($t + 2$)		All years ($t + 2$)	
	Gross Jobs (1)	Net Jobs (2)	Gross Jobs (3)	Net Jobs (4)
Incorporation Status			0.493*** (0.00392)	0.502*** (0.00400)
Labor Income Decile				
Below 10th	-0.135*** (0.00693)	-0.133*** (0.00607)	-0.0502*** (0.00646)	-0.0464*** (0.00551)
10th-20th	-0.0402*** (0.00452)	-0.0520*** (0.00347)	-0.00845** (0.00431)	-0.0196*** (0.00314)
20 to 30th	-0.0339*** (0.00392)	-0.0331*** (0.00318)	-0.0261*** (0.00371)	-0.0251*** (0.00289)
30th to 40th	-0.0260*** (0.00404)	-0.0266*** (0.00332)	-0.00990*** (0.00382)	-0.0102*** (0.00301)
40th to 60th	(Omitted)	(Omitted)	(Omitted)	(Omitted)
60th to 70th	0.0306*** (0.00577)	0.0241*** (0.00511)	0.00520 (0.00533)	-0.00177 (0.00458)
70th to 80th	0.0613*** (0.00595)	0.0540*** (0.00543)	0.00907* (0.00540)	0.000757 (0.00480)
80th to 90th	0.0928*** (0.00629)	0.0995*** (0.00591)	0.00592 (0.00567)	0.0110** (0.00522)
Above 90th	0.118*** (0.00598)	0.143*** (0.00560)	-0.0340*** (0.00546)	-0.0121** (0.00505)
Characteristics at $t - 1$				
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Location FE	Yes	Yes	Yes	Yes
Individual Controls	Yes	Yes	Yes	Yes
Observations	233,012	233,012	233,012	233,012
R-squared	0.038	0.059	0.146	0.215

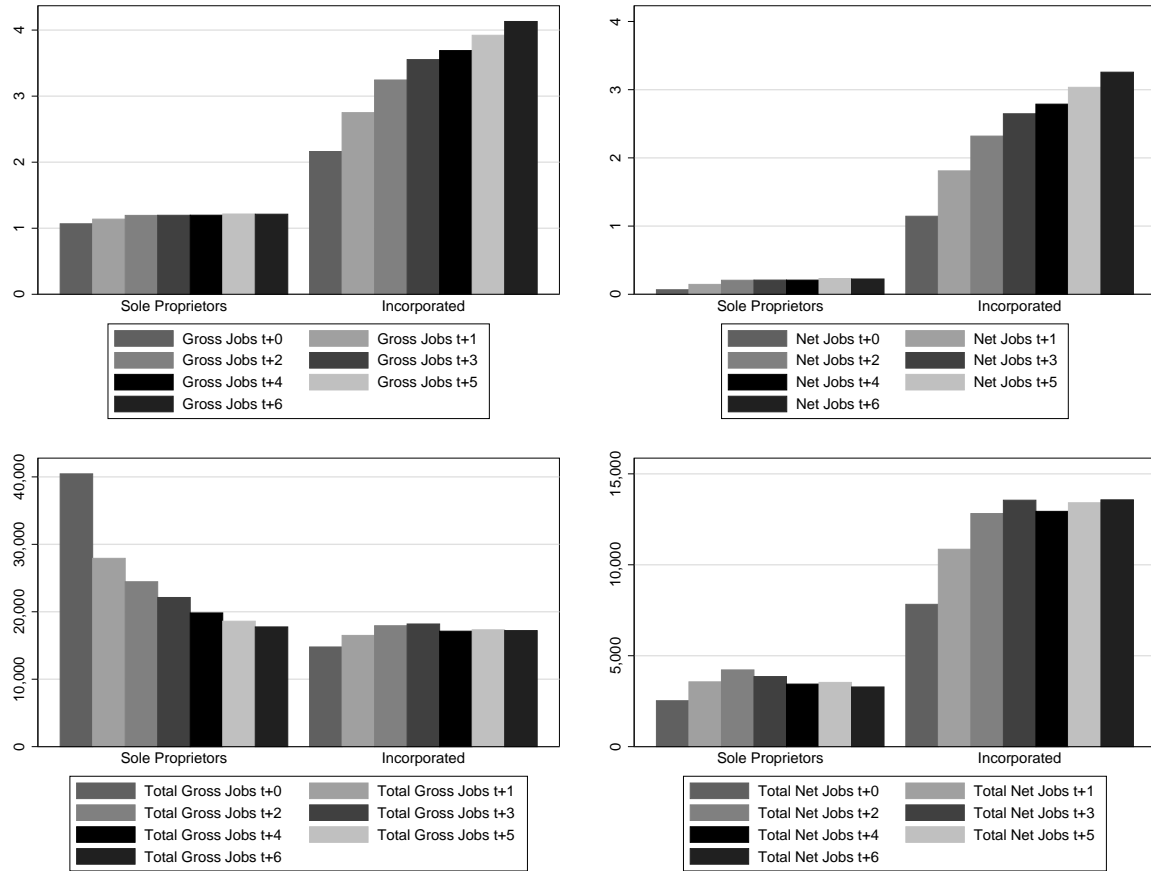


Figure 1: Total Gross and Net Job Creation by Incorporation Status

These figures displays gross and net job creation for new ventures created in 2005 by incorporation status. The top two figures shows mean gross and net jobs in the firms *conditional on survival* for $t = 0$ to $t = 6$. The bottom two figures show the economywide sum of gross jobs and sum of net jobs created by new businesses started at $t = 2005$ for $t + 0$ to $t + 6$.