

# What Do Small Businesses Do?<sup>1</sup>

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## Abstract

In this paper, we show that most small business owners are very different from the entrepreneurs that economic models and policy makers often have in mind. Using new data that samples early stage entrepreneurs just prior to business start up, we show that few small businesses intend to bring a new idea to market. Instead, most intend to provide an existing service to an existing market. Further, we find that most small businesses have little desire to grow big or to innovate in any observable way. We show that such behavior is consistent with the industry characteristics of the majority of small businesses, which are concentrated among skilled craftsmen, lawyers, real estate agents, doctors, small shopkeepers, and restaurateurs. Lastly, we show non pecuniary benefits (being one's own boss, having flexibility of hours, etc.) play a first-order role in the business formation decision. We then discuss how our findings suggest that the importance of entrepreneurial talent, entrepreneurial luck, and financial frictions in explaining the firm size distribution may be overstated. We conclude by discussing the potential policy implications of our findings.

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## 1. Introduction

Economists and policy makers alike have long been interested in the effects of various economic policies on business ownership. In fact, the U.S. Small Business Administration is a federally funded agency whose sole purpose is to help Americans “start, build, and grow businesses.” Researchers and policy makers often either explicitly or implicitly equate small business owners with “entrepreneurs.” While this association could be tautological, we show the typical small business owner is often very different than the entrepreneur that economic models and policy makers have in mind. For example, economic theory usually considers entrepreneurs as individuals who (1) innovate and render aging technologies obsolete (Schumpeter, 1942), (2) take economic risks (Knight (1921); Kihlstrom and Laffont (1979); Kanbur (1979), and Jovanovic (1979)), or (3) are considered jacks-of-all-trades in the sense that they have a broad skill set (Lazear, 2005). Policy makers often consider entrepreneurs to be job creators or the engines of economic growth.

In this paper we shed light on what the vast majority of small businesses actually do and, further, what they report *ex-ante* wanting to do. The paper proceeds in six parts. We begin by highlighting the industrial breakdown of small business within the US. When referring to small businesses, we primarily refer to firms with between 1 and 19 employees which employs roughly 20 percent of the private sector workforce. However, throughout our analysis, we also define alternative classifications such as firms with between 1 and 100 employees. As we show in this section, over two-thirds of all small businesses are confined to just 40 narrow 4-digit NAICS industries. All of these industries are ones where participants provide a relatively standardized good or service to an existing customer base. Specifically, these industries primarily include skilled craftsmen (e.g., plumbers, electricians, contractors, painters), skilled professionals (e.g.,

lawyers, accountants, and architects), insurance and real estate agents, doctors, dentists, mechanics, beauticians, restaurateurs, and small shop keepers (e.g., gas station owners and grocery store owners). Although there is still substantial within industry heterogeneity in size, we show these industries have a disproportionate share of small businesses. This composition of small businesses foreshadows our subsequent empirical results.

In Section 3 of the paper, we study job creation and innovation at small and/or new firms. First, using a variety of data sets, we show that most surviving small businesses do not grow by any significant margin. Most firms start small and stay small throughout their entire lifecycle.<sup>2</sup> Also, most surviving small firms do not innovate along any observable margin. We show that very few small firms report spending resources on research and development, getting a patent, or even copywriting or trade marking something related to the business (including the company's name). Furthermore, we show that nearly half of all new businesses report providing an existing good or service to an existing market. This is not surprising in light of the most common small businesses. A new plumber or a new lawyer who opens up a practice often does so in an area where existing plumbers and existing lawyers already operate.

Most of the existing research attributes differences across firms with respect to ex-post performance to either differences in financing constraints facing the firms (e.g., Evans and Jovanovic (1989) and Clementi and Hopenhayn (2006)), differences in ex-post productivity draws across the firms (e.g., Bonini and Simon (1958), Jovanovic (1982), Pakes and Ericson (1989), Hopenhayn (1992)), or differences in entrepreneurial ability of the firms owners (e.g., Lucas (1978)). In Section 4, we use new data which samples nascent small business owners

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<sup>2</sup> Haltiwanger et al. (2010) show that controlling for firm age there is no systematic relationship between firm size and growth. They conclude that the small firms that tend to grow fast (relative to large firms) are those newly established small firms. We discuss how our results add to these findings in later sections. In particular, we show that most surviving new firms also do not grow in any meaningful way.

about their expectations for the business in the future to show that these stories are incomplete. When asked at the time of their business formation, most business owners report having no desire to grow big and no desire to innovate along observable dimensions. In other words, when starting their business, the plumber and lawyer do so while expecting to remain small well into the foreseeable future and with little expectation to innovate by developing a new product or service or even enter new markets with an existing product or service.

If most small businesses do not want to grow or do not want to innovate, why do they start? We address this question in Section 5. Again, we use a new data set that samples nascent business owners at the time they were starting their business that specifically asks about motives and expectations. We find that over 50 percent of new businesses reported that non pecuniary benefits were the primary reason as to why they started their business. Non pecuniary benefits included answers such as “wanting flexibility over schedule” or “to be one’s own boss”. By comparison, only 34 percent of respondents reported that they were starting the business to generate income and only 40 percent indicated that they were starting a business because they wanted to create a new product or because they had a good business idea. Using the panel nature of the data, we show that those small businesses that started for other than innovative reasons were less likely to subsequently grow, less likely to report wanting to grow, less likely to subsequently innovate, and less likely to report wanting to innovate.

Collectively, these results suggest that there are other first order reasons why small businesses form aside from the innovation or growth motives which are embedded in most theories of entrepreneurship. For example, non pecuniary benefits of small business ownership may be an important driver of why firms start and remain small. Additionally, some industries may have a natural size of production at an establishment level that is quite low (e.g., insurance

agent). In Section 6 of the paper, we discuss how our results challenge much of the existing work on entrepreneurship and small firm dynamics. In particular, we highlight how our findings suggest that the importance of entrepreneurial talent, entrepreneurial luck, and financial frictions in explaining the firm size distribution may be overstated. In the last section of the paper, we discuss the policy implications of our results.

The work discussing the diversity of motives and expectations among small businesses in developing economies is more extensive than for developed economies.<sup>3</sup> Recent work by La Porta and Shleifer (2008) and Banerjee and Duflo (2011) show that most small businesses in developing economies do not grow or innovate in any observable way. In the latter sections, we also discuss how the qualitatively similar outcomes we observe are driven by different forces than in developing economies.

Overall, our results show that there is substantial skewness among small businesses within the U.S both in actual and expected growth and innovation behavior. Most small businesses do not want to grow or innovate which are the usual cornerstones of most of these entrepreneurial models and policy justifications. Our results suggest that it is often inappropriate for researchers and policy makers to use the universe of small business (or self employment) data to test standard theories of entrepreneurship. Researchers and policy makers interested in testing theories of entrepreneurship may need to use more specialized data sets like the ones that track small businesses seeking venture capital funding because these firms have been shown to be

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<sup>3</sup> Two notable exceptions include Bhidé (2000) and Ardagna and Lusardi (2008). Bhidé (2000) examines the attributes of the founders of many successful firms and concludes that the actions and behaviors of the founders are an important determinant of firm growth. Ardagna and Lusardi (2008) use survey data from the Global Entrepreneurship Monitor (GEM) to show that there are demographic differences between those individuals who report starting a business because they had a good business opportunity or other business owners.

more likely to actually grow or innovate relative to other small businesses.<sup>4</sup> Additionally, policy makers wanting to promote growth and innovation may want to consider more targeted policies as opposed to creating policies that target the universe of small businesses.

## **2. Industrial Composition of Small Businesses**

The goal of this section is to show that most small businesses are concentrated in a small number of 4-digit NAICS industries that mostly provide standard services to local customers. This context is important when interpreting our findings that the majority of small businesses do not intend to grow or innovate in any substantive way.

To examine the types of small businesses that exist within the U.S., we use data from the Statistics of U.S. Businesses (SUSB) compiled by the U.S. Census Bureau.<sup>5</sup> To create these statistics the Census compiles data extracted from the Business Register, which contains the Census Bureau's most current and consistent data for U.S. business establishments.<sup>6</sup> The data cover most U.S. firms with at least one paid employee. Below, we discuss how our results would extend if we included information from the non-employer firms. We focus our attention on the statistics from the years 2003 to 2007, all of which are coded using the NAICS 2002 industry definitions; additional data from the Economic Census are also available for 2007. However, it should be noted that our results are nearly identical if we pick any year between 1998 and 2008. Throughout the paper we classify business size by total firm employment in

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<sup>4</sup> Some papers in the literature take this approach. See, for example, recent work by Kaplan and Lerner (2009), Puri and Zarutskie (2010), and Hall and Woodward (2010). As shown by Puri and Zarutskie (2010), firms who seek venture capital funding are much more likely to grow than the universe of remaining firms.

<sup>5</sup> For a complete description of the data, see <http://www.census.gov/econ/susb/>.

<sup>6</sup> The Business Register is updated continuously and incorporates data from the Census Bureau's economic censuses and current business surveys, quarterly and annual Federal tax records, and other departmental and federal statistics. The data includes information from all NAICS industries aside from crop and animal production; rail transportation; National Postal Service; pensions, welfare, and vacation funds; trusts, estates, and agency accounts; private households; and public administration.

order to exclude large firms operating many small establishments.<sup>7</sup> For most purposes in this section, we refer to "small businesses" as those businesses with between 1 and 20 employees, although we consider alternative definitions based on different employment size cutoffs.

As is already well known, small businesses are a very large fraction of the population of employer firms. In Figure 1, we use the SUSB data from 2007 to construct the cumulative distribution function for firm size using several measures of economic activity. In 2007, there were roughly 6 million firms with paid employment; 90 percent of these firms had fewer than 20 employees. These firms comprised 20 percent of aggregate paid employment and about 15 percent of sales receipts and payroll. The conclusions only change slightly if we look at firms with fewer than 100 employees. The additional firms with between 20 and 99 employees represent an additional 8 percent of all employer firms and 15 percent of aggregate employment.

Next we study the concentration of small businesses with paid employees at very fine levels of industry classifications. These results yield two important messages. First, most small businesses are concentrated in a few detailed industry classifications. Second, within these few detailed industries, the distribution of employment across all firm sizes is different than the overall distribution for all other industries. Most of the industries in which small businesses reside are also industries in which a disproportionate amount of economic activity takes place in small firms.

We start by taking the universe of all employer firms with fewer than 20 employees. Within these small firms, we rank the represented 4-digit industries by a crude measure of

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<sup>7</sup> A firm (termed enterprise) may consist of many establishments, which are distinct locations of business activity. For example, the Starbucks corporation operates thousands of small establishments. Given our focus on total firm employment, we do not treat the individual Starbucks establishments as small businesses.

concentration, namely each industry's share out of the set of small firms.<sup>8</sup> Specifically, we define:

$$x_j = \frac{s_j}{\sum_j s_j}$$

where  $s_j$  is the number of small businesses in industry  $j$  and  $x_j$  is the share of small businesses in industry  $j$  out of all small businesses (regardless of industries). This measure gives the importance of a given industry out of the universe of all small businesses with fewer than 20 employees. There are 294 four-digit NAICS industries in the SUSB data; industries are ranked from 1 to 294, with the industry with the largest  $x_j$  being ranked 1.

Figure 2 shows the cumulative sum of  $x_j$  across each of the 4-digit industries by rank. For example, the first twenty 4-digit industries account for just about 50 percent of all firms with fewer than 20 employees. In other words, when talking about small businesses, roughly half of them fall into only 20 narrowly defined 4-digit industries. The top 40 4-digit industries comprise two-thirds of all firms with fewer than 20 employees. The employment shares for the top 20 industries and the top 40 industries (out of all employment in firms with fewer than 20 employees) were also nearly 50 percent and 65 percent, respectively.

Table 1 lists those top forty 4-digit industries ranked by  $x_j$ . Again, two-thirds of all small businesses in 2007 are in one of these forty 4-digit industries. As seen from the list, most small business are either restaurants (full service, limited service, or bars), skilled professionals (doctors, dentists, lawyers, accountants, architects, consultants), skilled craftsmen (general contractors, plumbers, electricians, mason workers, painters, roofers), professional service

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<sup>8</sup> The national SUSB data are available at the 6-digit level of aggregation. Without much loss of generality, we aggregate these data to a 4-digit level of aggregation.



provides (clergy, insurance agents, real estate agents, and travel agents), general service providers (auto repair, building services such as landscaping, barbers/beauticians), or small retailers (grocery stores, gas stations, pharmacies, and clothing stores).

These results are robust to alternative cuts of the data. If we extended our classification to the top sixty 4-digit industries (which comprise over 80 percent of all firms with fewer than 20 employees), the type of industries in which small businesses reside are not altered. The firms ranked 41 to 60 are similar in spirit to those in the top 40. For example, they include dry cleaners, office supply stores, hardware stores, jewelry stores, auto dealers, liquor stores, furniture stores, and the like. Additionally, if we extend our results to those firms with fewer than 100 employees, our results are very similar. The 40 industries listed in Table 1 also represent 66 percent of the firms and 61 percent of the employment in firms with fewer than 100 employees.

One concern may be that the important small business industries may reflect the overall size of the industry rather than the role of small businesses within the industry. In fact, the bulk of small businesses are concentrated in industries where a disproportionate amount of employment is concentrated in small firms. For example, looking within the skilled craftsmen industries, 48 percent of all employment (on average) is in firms with between 1 and 20 employees. Notice, this figure is much larger than the 20 percent of employment that is in firms with between 1 and 20 employees for the entire economy (as shown in Figure 1).

To better document the relationship between the importance of an industry within small businesses and the amount of activity that takes place within small firms within that that

industry, we present Figure 3.<sup>9</sup> The x-axis of Figure 3 are deciles based upon  $x_j$ , the number of small firms within a given industry out of all small firms in the economy. As in Figure 2 and Table 1, we define small firms as those firms with between 1-19 employees. However, the patterns we show are broadly consistent if we define small firms to have between 1 and 99 employees. The y-axis of Figure 3 is the within industry share of employment in small firms relative to all employment in the industry averaged across the industries in the decile. Formally, we define the within industry share of employment in small firms as:

$$y_j = \frac{e_j^s}{e_j^n}$$

where  $e_j^s$  is the number of employees in small businesses within industry  $j$  and  $e_j^n$  is the number of employees in all businesses (regardless of size) within industry  $j$ . The figure is drawn using data from 2007. The results of Figure 3 show that industries that comprise the bulk of small businesses (i.e., they have a high  $x_j$ ) are also industries where more of the employment within the industry is in small firms (have a high  $y_j$ ). The top decile of industries with respect to  $x_j$  is comprised of the first 29 industries documented in Table 1. These industries comprise about 60 percent of the number of small businesses and about 60 percent of the employment within small businesses. For these industries, about 40 percent of employment *within* the industry, on average, is in small firms. As seen from Figure 1, only about 20 percent of employment across all industries is in small firms. The high  $x_j$  industries are skewed toward small firms. As  $x_j$  falls and the industries become less important as a fraction of all small businesses, the scale of these industries, for the most part, monotonically increases.

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<sup>9</sup> We also performed a different set of robustness results. In particular, we made a measure of the importance of small businesses in industry  $j$  out of all small businesses adjusting for the importance of industry  $j$  out of all firms regardless of size. The patterns in Table 1 and Figures 1-3 were robust to this adjustment.

A few other comments can be made about Figure 3. First, the top three deciles of  $x_j$  contain roughly 90 4-digit industries that comprise roughly 85 percent of all small businesses. Even the industries in the second and third deciles have within industry employment ( $y_j$ ) that is skewed toward small firms. Second, the difference between the average  $y_j$  for the industries within the first decile is statistically different from the average  $y_j$  for the industries within all other deciles. For example, the p-value of the difference between the first and the second deciles is 0.017 and the p-value of the difference between the first and fourth deciles is  $< 0.001$ . Likewise, the p-value of the difference between the average  $y_i$  for the second and third deciles relative to the fourth decile is about 0.03. This figure suggests that it may not be surprising that most small firms do not grow nor report wanting to grow given that most small firms are in industries where the observed scale of production is quite low.

Our analysis in this section focuses on employer firms, which have at least one paid employee. Most firms within the U.S., however, are non-employer firms. In 2007, for example, there were 21.7 million zero employee firms which represented roughly 78% of all firms. Often, these are second businesses or independent consultants who report self employment income on their Federal income tax returns. As a result, despite their importance in the number of firms, the non-employers collectively represent less than 4 percent of all sales or receipts within the U.S. during a given year.<sup>10</sup> Because many of the existing datasets, exclude the non-employers from their analysis, it is hard to systematically analyze their composition. Recently, however, the U.S. Census has released data that segments the non-employer firms both in numbers and receipts by broad industry classifications.<sup>11</sup> We summarize this data for 2007 in Appendix

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<sup>10</sup> Even though they are currently small, the non-employers are an important source of future paid employee firms. Many eventual employer firms start out as non-employers. See Davis et al. (2007) for a more detailed discussion.

<sup>11</sup> See <http://www.census.gov/econ/nonemployer/index.html>.

Table A1. The patterns documented in Table 1 carry through to non-employers. Most non-employer firms are in a handful of industries where the bulk of production takes place in small firms. As a result, we feel our broad results extend to the inclusion of the non-employer firms.

The major take away from this section is that most small businesses are from a limited set of narrowly defined industries where more of the industries' economic activity takes place in small firms. As we discuss in later sections of the paper, these industries usually do not match the theoretical models of "entrepreneurship" that is usually put forth in the literature.

Before proceeding, we wish to acknowledge that even within the industries where most small businesses are located there are many firms that are still quite large. John Haltiwanger, in his discussion of our paper that follows, emphasizes this point. Any theory focusing on the distribution of firm size needs to account for the fact that (1) most small businesses are concentrated in a small set of industries, (2) the fraction of employment in small businesses within these small business intensive industries ( $y$ ) is higher than in other industries, and (3) even within the small business intensive industries, there are still many large firms. We emphasize the first two points while Haltiwanger emphasizes the third.

### **3. Ex-Post Small Business Growth and Innovation**

#### **A. Small Business Growth**

It is well documented that there is heterogeneity in the extent to which small businesses grow across observable factors such as firm size or firm age. Most recently, Haltiwanger et al. (2010) find, that there is little relationship between firm size and firm growth conditional on firm age. Employment growth is driven by young firms, who also happen to be small. In this section, we use some new and existing data sets to illustrate some additional facts about the distribution of

growth propensities across both small and young firms. Specifically, we show that even among young firms and conditional on survival, growth is still rare overall.

Tables 2a and 2b show data from the 2005 Business Dynamic Statistics (BDS). The BDS is produced by the U.S. Census Bureau from longitudinal annual establishment-level administrative data similar to the source data for the SUSB discussed above. The BDS provides measures of gross job creation and destruction by firm size and age for the years 1977 through 2009. Sector level measures are available for the US, and overall measures are available by state. Again, like the SUSB, the database only tracks the employment patterns of employer firms. Table 2a shows the percent of businesses within different firm age categories that are businesses with fewer than 20 employees. We do this for the entire economy (top row) and then separately within different one digit sectors.

Table 2a should be read as follows. In 2005, of all operating firms within the economy that have survived fewer than ten years, 92 percent have fewer than 20 employees (column 1). Within the construction sector (column 1, fourth row), 93.6 percent of operating “young” firms have fewer than 20 employees. Table 2b shows the share of employment in firms with fewer than 20 employees as opposed to the share of firms. The employment share exhibits similar patterns: for example, firms with fewer than 20 employees have 44.8 percent of the total employment for all firms who have been in existence for fewer than ten years.

Tables 2a and 2b highlight two important facts. First, among mature firms (firms in existence between ten and twenty-five years), most firms and much of the employment is in firms with fewer than twenty employees. For example, across the economy as whole, small firms represent nearly 90 percent of all firms and nearly 25 percent of all employment out of all firms

that have been in existence between ten and twenty-five years. Even well into their lifecycle, the overwhelming majority of firms remain small.

Second, similar to the results in the previous section, there is substantial variation among industries. Relative to construction, very little of employment of mature firms is in small businesses within the manufacturing industry (16 percent). Additional industries that include a high concentration of the employment of mature firms being in small businesses include the FIRE, wholesale trade, retail trade and service industries. Again, this is consistent with the results from Table 1 and Figure 3. The heterogeneity in the firm size distribution across sectors implies differences in dynamics by sector.

To shed light on employment dynamics for firms of different ages and industries, we use data from a variety of additional sources. We start by using data from the 2003 Survey of Small Business Finances (SSBF).<sup>12</sup> The SSBF is a random sample of businesses with fewer than 500 employees and was conducted by the Board of Governors of the U.S. Federal Reserve. The survey is designed to measure the financial position of these businesses. However, the survey also contains other background questions. In 2003, firms were asked to state whether in the past year the total employees within their business grew, remained the same, or contracted. Firms were also asked the same question over a three-year horizon.

The responses to these questions by small firms are shown in Table 3. Like above, we define small firms as those firms with fewer than 20 employees. We break down the responses by firm age to try to highlight differences between newer businesses and more established businesses. The SSBF asks businesses to report how long the business has been in existence. As seen from the table, the overwhelming majority of small firms do not grow by adding employees

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<sup>12</sup> The SSBF was formerly known as the National Survey of Small Business Finances. It was a quinquennial survey that began in 1983 and was last conducted in 2003.

year to year or even over three-year periods.<sup>13</sup> Not conditioning on firm age, only 14 percent of surviving small businesses added an employee between 2002 and 2003 and only 21 percent added employees between 2000 and 2003. Taking the converse, roughly 80 percent of surviving small firms did not grow at all over a relatively long three year period. The percentages are slightly higher among newer firms. However, even among small firms which have been in existence between 1 and 10 years, only 19 percent grew between 2002 and 2003 and only 28 percent grew between 2000 and 2003. These data show that while most aggregate employment growth may come from small (new) firms growing big, the vast majority of small (new) firms do not grow, even over longer horizons.

Within the modest share of growing firms, the SSBF data does not tell us by *how much* the firms grew. To assess this question, we turn to the Kauffman Firm Survey (KFS). The KFS is a panel study of 4,928 businesses that were newly founded in 2004 administered by the Kauffman Foundation.<sup>14</sup> As shown in Haltiwanger et al. (2010), it is the new firms that contribute, on average, to job growth. Yet, as we have just shown, this is rare for typical small businesses. While much employment growth is due to new firms, it is not true that most new businesses generate employment growth. To create the KFS sample, researchers began with a sample frame of nearly 250,000 new businesses started in 2004 provided by the Dun and Bradstreet database. From this data, the KFS oversampled businesses in high tech industries and businesses for whom research and development employment in the primary business industry was high. The final sample admits 4,928 firms, which are re-surveyed annually in

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<sup>13</sup> We exclude newly founded firms that are unable to answer the employment change question because they did not exist in the base year. The firms responding to the 1 year change question are at least 1 year old, and the firms responding to the 3 year change question are at least 3 years old.

<sup>14</sup> The Kauffman Foundation is an organization whose goals are to study and understand entrepreneurship. Information about the organization can be found at <http://www.kauffman.org/>.

follow up interviews. Currently, public use data is available on these firms up through 2009. For the work below, we only focus on those firms that have survived through 2008. There were 2,617 such firms in the data. When using the KFS data, we use the survey weights provided which are designed to make the firms in the sample representative of all new firms in the economy.

Because the KFS is a four year panel, we can assess the growth rate of employment for new businesses within the KFS over four years. In each wave of the survey, the KFS asks firms to report the number of their employees. Column I of Table 4 shows that between 2004 and 2008, 41.9 percent of the surviving firms in the KFS reported growing the total number of employees within their business. In columns 2 and 3 of Table 4, we show the fraction of new surviving businesses who added more than 5 employees (column 2) and 10 employees (column 3) between 2004 and 2008. While about forty percent of the surviving new firms within the KFS added employees, very few added more than one or two employees. Specifically, 60 percent of all new firms in this sample did not add an employee, 90 percent added fewer than 5 employees, and 97 percent added fewer than 10 employees.

The results from the KFS hold more broadly in the U.S. We find that small businesses within the top small business industries (i.e, the ones documented in Table 1) actually have lower than average job creation rates. To see this we pool employment change data from the SUSB from the years 2003 to 2006. These data are released as a companion to the levels reported in the SUSB annual data. Using the same administrative data, the Census Bureau measures the number of jobs created (either from expanding or new establishments) or destroyed (either from contracting or exiting establishments) at the establishment level and aggregates these into annual



measures of gross job creation and destruction by industry and firm size.<sup>15</sup> At the 4-digit industry level, we compute for each size category the gross job creation rate, the gross job birth rate, and the gross job destruction rate. We split job creation into jobs created at continuing establishments (the gross job creation rate) and jobs created at opening establishment (the gross job birth rate). The job destruction rate reflects job loss at both contracting or exiting establishments. We follow Davis, et al. (1996) and define these rates as follows:

$$g_{jt}^{Ms} = \frac{M_{jt}^s}{(e_{j,t}^s + e_{j,t+1}^s) / 2}$$

where  $M_{jt}^s$  represents a measure of job creation or destruction (either jobs created from expansion, jobs created from births, or overall jobs destroyed from contracting and exiting establishments) for small businesses,  $s$ , within industry  $j$  between period  $t$  and  $t-1$ , and  $e_{jt}^s$  is defined as above to be the number of employees in small businesses within industry  $j$  during period  $t$ . Consistent with our earlier definition, we define small businesses to be those firms with between 1 and 20 employees. Davis, et al. (1996) show that this form of growth rate has a number of desirable properties: it accommodates entry and exit, and is equivalent to a log difference up to second order.

We use these growth rates to ask whether or not industries that comprise a large fraction of small businesses can predict the degree of job creation or destruction for small businesses within that industry, conditional on aggregate industry characteristics. To do this, we estimate the following:

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<sup>15</sup> The distinction between firms (referred to as enterprises by the Census Bureau) and establishments is important. The SUSB data report expansions (contractions) by *firm* size, by measuring the employment changes at the establishment level. If the Starbucks Corporation opens 100 new stores in a year and closes 50, the gross job creation and destruction from the establishment births and deaths (as well as from continuing establishments) would be attributed to the 2500+ firm size category.

$$g_{jt}^{Ms} = \gamma_0 + \gamma_1 x_j + \Gamma Z_j + \mu_t + \eta_{jt}^s$$

where  $g_{jt}^{Ms}$  takes one of three different measures, depending on the regression, representing either the gross job creation rate, the gross job birth rate, or the gross job destruction rate for firms of small firms in industry  $j$ . These measures are define above. Likewise, as above,  $x_j$  represents the share of small businesses in industry  $j$  out of all small business across all industries. This measure is the same as what was summarized in Figure 2 and Table 1.  $Z_j$  is a vector of industry level controls and  $\mu_t$  is a vector of year dummies. The industry level controls include industry wide measures of gross job creation rate, the gross job birth rate, and the gross job destruction rate. The sample for this regression is all 4-digit industries with non-missing measures of  $M_{jt}^s$  during the 2003-2006 period. This gives us 929 observations for the small business gross job creation regressions, 666 observations for the small business gross job birth rate regression, and 656 observations for the small business gross job destruction regression. The difference in sample sizes is due to more missing data for the measures of births and job destruction relative to job creation at the 4-digit industry level.

Table 5 reports the estimation results. We estimate each specification first where each industry is equally weighted and second where each industry is weighted in proportion to its share of small businesses. The weighted estimation is similar to a grouped data estimator and would deliver the same point estimates as firm level data if each small firms employment share within an industry were equal.<sup>16</sup> The results support our earlier claims that the "typical" small business does not create jobs. The small business share of an industry has little to say about small business job creation through new small businesses or small business job destruction (columns 4

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<sup>16</sup> This is a reasonable approximation since all firms have fewer than 20 employees, so there would be very little variation in the employment share within an industry if this were estimated with the underlying administrative micro data.

and 5 of Table 5). However, it is a powerful predictor of weaker than average small business job creation for existing firms (columns 1-3 of Table 5). The most common small businesses (those with a high  $x_j$  shown in Table 1) grow slower than average. These results hold even controlling for each industry's overall characteristics (comparing column 1 vs. column 2 of Table 5). One may be concerned that the difference between the strong effects for job creation relative to the no effects found for job births and job destruction could stem from differences in the samples across the regression. Column 3 of Table 5 shows such concerns are unwarranted. In this regression, we restrict the job creation regression to only include observations that had non-missing job births and job destruction. The job creation results are unaltered with this additional sample restriction.

According to the weighted results, for each percentage point increase in the share of small businesses, an industry's small business job creation rate falls by a little less than three-quarters of a percentage point. To provide greater context, a one-standard deviation increase in  $x_j$  (1.1 percentage points) reduces the job creation rate by roughly 0.8 percentage points. The average weighted job creation rate for the sample was 14.6 percent. So, a one-standard deviation increase in the industry share of small businesses reduces the small business job creation rate by about 6 percent (0.8 divided by 14.6). When industries are treated equally, a one standard deviation increase in  $x_j$  reduces the industry small business job creation rate by roughly 8 percent. All the results are robust to alternative specifications of industry controls.

It may initially be surprising that so little job creation comes from the industries that most small business owners are likely to enter. However it is consistent with an understanding of the important heterogeneity among small businesses. Most small businesses (those highlighted in Table 1) start small and stay small throughout the life of their business. Collectively, we can

conclude three things from the results in Tables 2-5. First, there is substantial skewness across firms in the extent to which they grow over time. While some firms do grow (in terms of the number of employees) over time, most do not. Only a small portion of small firms add a more than ten employees over the life of their business. To this end, the bulk of employment in mature firms is still concentrated in firms with fewer than 20 employees. Second, even among new or young firms, most firms do not grow by any meaningful amount, even conditional on survival. Finally, a portion of the heterogeneity in employment growth for small firms is explained by industry. While many mature businesses in manufacturing are quite large, most mature businesses in other industries like construction remain quite small. The industries that tend to remain small are the industries that tend to comprise the bulk of small businesses.

We wish again to stress that even within these small business intensive industries there is considerable heterogeneity and skewness. The focus of this paper is on the behavior of small firms, which in our selected small business intensive industries account for nearly half of the employment. John Haltiwanger, in his discussion of this paper that follows, looks closely at the other half. It turns out that in many of these industries where employment in small firms is overrepresented, the firms within these industries can also be more dynamic than average. In retail trade, for example, the industry is composed of local shopkeepers and big box stores. In the retail trade industry, job creation was almost 10 percentage points higher than average over the two year period from 2003 to 2005 relative to other industries. However, almost all of the job creation was due to a relatively small number of high impact firms. The high degree of skewness, especially in these industries, makes analyzing the averages very deceiving. As we show, the typical (modal or median) small business is not creating jobs. In the last section, we return to the potential implication of these findings for public policy.

## **B. Small Business Innovation**

In this sub-section, we document that there is also substantial heterogeneity across firms in the extent to which they successfully innovate along observable measures. Again, while some authors have shown that a large share of measured innovation (patent applications for example) is attributed to small businesses, the converse is not true.<sup>17</sup> Most small firms do not seem to innovate along those observable margins. Before proceeding, we want to stress that it is hard to measure all aspects of potential small business innovation via the surveys we are analyzing. As a result, we focus on some broad measures of innovation that are asked of firms within the surveys.

We begin by documenting the fact that very few new firms innovate via patent, trademarks, or copyrights during the first 4 or 5 years of their existence using two data sources. First, we continue our use of the Kaufman Firm Survey focusing on the same sample as above. The KFS survey asks respondents to report separately whether they have already applied or are in the process of applying for any patents, copyrights, or trademarks. We focus on the responses in 2008 when the firms have been in business for four years already. These results using the 2008 data from the KFS are shown in Table 6. Within the first four years of business, only 2.7 percent of the businesses in the sample had already applied or were in the process of applying for patents. Copyright and trademark usage is slightly higher but still most firms do not innovate at least according to these crude observable measures. According to the KFS, nearly 85 percent of small businesses did not acquire a patent, trademark or copyright during their first four years of existence.

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<sup>17</sup> See Acs and Audretsch (1990) and the cites within.

We augment our analysis of patents and other measure of innovation using data from the Panel Study of Entrepreneurial Dynamics II (PSED).<sup>18</sup> The PSED started with a nationally representative sample of 34,000 individuals during the fall of 2005 and the early winter of 2006. An initial screening survey identified 1,214 "nascent entrepreneurs". To be considered a nascent entrepreneur, individuals had to meet the following four criteria. First, the individual had to currently consider themselves as involved in the firm creation process. Second, they had to have engaged in some start up activity in the past twelve months. Third, they had to expect to own all or part of the new firm. Finally, the initiative, at the time of the initial screening survey, could not have progressed to the point that it could have been considered an operating business. The goal was to sample individuals who were in the process of establishing a new business.

In the winter of 2006, after the initial screening interview, the 1,214 respondents that had been initially identified as being in the process of starting a business were surveyed about a wide variety of the activities associated with their business start up. As part of the first real interview, respondents were asked detailed questions about their motivation for starting the business, the current activities undertaken as part of the start up process, the competitive environment in which the business would take place, and their expectation of desired future business size and activities. Follow up interviews occurred annually for 4 years so that the data has a panel dimension. When analyzing the PSED data, we use three samples. The first is a sample of all 1,214 PSED respondents. The second sample is the 602 respondents who actually had positive revenues during their first interview in 2006. This latter sample distinguishes people who only said that they were planning to start a business from those who actually followed through and

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<sup>18</sup> There was an early wave of the PSED (PSED I) that was a test run for the bigger PSED II. We do not use the initial data in our analysis. All data and documentation for the PSED can be found at <http://www.psed.isr.umich.edu/psed/data>.

engaged in some market business activity. The third sample is the 162 respondents who had positive revenues from the same business venture in 2010, four years after the first interview.

In terms of innovation activity, the PSED asks three different types of questions. First, the PSED respondents were asked a similar question as the KFS respondents with respect to patent, trademark, and copyright application. However, instead of being asked about the three measures separately, they were asked one joint question. As seen from the PSED data in Table 7, only between 5 and 6 percent of the new firms applied for patents, trademarks, and copyrights during their first few years in existence. By the fifth year of operation, surviving firms appear similar to those in the KFS with roughly 17 percent having obtained a patent, trademark or copyright.

Of course patents, copyrights, and trademarks are imperfect measures of innovation. Many firms can innovate without applying for a patent, and many firms can trademark their company name without doing any real innovation. We focus first on these measures because they are easily observable in both the KFS and the PSED. The PSED, however, also has broader measures of innovation. In a separate set of question, businesses were asked directly whether they have "developed any proprietary technology, processes, or procedures". This is a slightly broader measure of innovation than patent, trademark and copyright applications in that it conceivably covers a more fluid set of activities that the business owner could relay about the innovation in production or business model that is taking place within their business. Yet, only between 6 and 8 percent of new businesses (depending on the sample) reported that they had developed any proprietary business practices or technology during their first few years of

business. Even conditional on survival five years later, 80 percent of firms still report not developing any proprietary technology, process or procedure.<sup>19</sup>

The PSED asks one last broad question about the potential innovation taking place within the firm. This question asks about how the product or service produced by the businesses compares with the products and services of other producers within the market. Specifically, PSED respondents were asked: “Right now, are there many, few, or no other businesses offering the same products or services to your [intended] customers?” Respondents were allowed to provide one of the following answers: many, few, or no other. This question is informative in the sense that it states whether the firm is providing a new product or service to existing customers or an existing product or service to potentially new customers. Across the three samples, between 36 and 43 percent of new business owners report providing a similar service to an existing customer base as existing firms in the market. These businesses, more often than not, provide a standardized service (e.g., plumbing) to existing local customers. Conversely, Table 7 also shows that fewer than 20 percent of respondents reported that no one other business was provided their expected product or service to their expected customer base.

There was substantial variation in the response to this question across business owners in different industries. For example, owners who reported starting a business in the professional, health, construction and real estate industries, were between 7.5 and 9.5 percentage points more likely to report saying that they were starting their business in an area where there were many current providers of the service to their expected customer base. Owners in these same

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<sup>19</sup> We should be wary of putting too much emphasis on self reports of innovative behavior by small businesses. However, most behavior stories of how the business owners would respond to such questions would likely lead us to believe that the innovation numbers are upper bounds on actual behavior. This would occur if the respondents were more likely to report that they were innovative even if there was no actual innovation taking place within the business.



industries were nearly 10 percentage points less likely to report that they were providing a new product or service or were targeting an underserved customer base.

#### **4. Ex-Ante Expectations About Growth and Innovation**

In this section, we document that many business owners have no expectation or desire to grow or innovate when they start their business. One of the strengths of the PSED data is that it asks the nascent business owners about their expectations for the business, their desired future business size, and for their motivations for starting the business. For example, all new firms were asked the following: “Which of the following two statements best describe your preference for the future size of this new business: ‘I want this new business to be as large as possible’ or ‘I want a size I can manage myself or with a few key employees’?”. The top row of Table 7 shows the response to this question across our three different PSED samples. For the sample of those businesses who lasted to 2010, we report their expectations when they were first asked in 2006. Nearly three quarters of all respondents, regardless of sample, reported they wanted to keep their business small.

Of course the meaning of a manageable size could vary across respondents. In a separate part of the survey, the respondents were asked to provide their expectation as to the number of employees that the firm would employ when the firm was 5 years old. Again, we report the responses for each sample when they were first asked in 2006. The median number of employees was between 3 or 4, depending on the sample. Even the 75th percentile of responses was small as respondents only expected to employ between 6 and 10 employees. Not only do very few small businesses grow, most of them do not want or expect to grow when they form their new business.

The PSED also asks about expected innovative activity. Specifically, businesses were asked, at the inception of starting their business, whether they expected to innovate in the future. These results are also shown in Table 8. For example, only roughly 10 percent of all new businesses reported that they plan to develop proprietary technology, processes, or procedures in the future. The numbers are slightly higher with respect to a business's expectation about future patent, copyright and trademark behavior. This is likely because many firms trademark the name of their business.

Firms in the PSED were also asked if they expected that research and development will be a major priority for the business. Again, as seen in Table 8, nearly 80 percent of all new businesses report that they have no plans for research and development to be a majority priority for the business when they are establishing the business.

The results in Table 8 suggest that the observed lack of innovation and growth may be deliberate; When starting their business most business owners have no plans to grow or innovate in the future. Interestingly, despite new business owners' expectations that their businesses will remain small with little innovation, they remain committed to starting and running a firm. In the next section, we examine the stated motives of nascent small business owners and explore how these motives correlate with expectations.

## **5. Motivations For Starting Businesses**

To explore heterogeneity in founders' motives, we again turn to the PSED data. As part of the initial survey of the PSED, the business owners were asked "Why did you want to start this new business?". The respondent could report up to two potential motives. The respondents provided unstructured answers and the PSED staff coded the answers into 44 specific categories. All the categories are listed in Appendix Table A2, along with the number of all PSED respondents who

provided the reason on either their first report (in the first parentheses) or on their second report (in the second parentheses).

We took the raw responses to the question “Why did you start your business” and created five broad categories of our own. The five categories were: (1) non pecuniary reasons, (2) reasons related to the generation of income, (3) reasons related to the desire to develop a new product or because they had a good business idea, (4) reasons related to the fact the respondent has no better job options, and (5) all other reasons. The main responses in the non pecuniary category include: “want to be my own boss”, “want flexibility over my schedule”, “want to work from home”, “enjoy the work/it is my hobby”. The main responses in the generating income category include: “to make money” or “need extra income”. The main responses in the new product/business idea category include: “satisfy a business need”, “there is high demand for this product/business”, “untapped market”, and “lots of experience at this type of work”. A full breakdown of our classification of the raw responses into these five broad categories can also be found in Appendix Table A2.

Table 9 provides the distribution of first responses by category (column A) and the distribution of either the first or second response by category (column B) for the three PSED samples discussed above. Three preliminary things should be noted. First, only 60 percent of respondents provided a second response. Second, given that the respondents could provide any answer they wanted, the first and second response often fell into the same broad category (e.g., answer 1 was “be own boss” and answer 2 was “have flexibility over schedule”, both of which we count as being a non pecuniary benefit of starting a business). Third, summing down column A exactly equals 100 percent while summing down column B exceeds 100 percent given that respondents could report a second answer.

The main result from Table 9 is that there is substantial heterogeneity across respondents in their reported primary reason for starting a small business. In particular, non pecuniary benefits play a leading role for most respondents. These results are consistent across all three PSED samples. For example, between 35 and 37 percent of first reports across all samples referred to non pecuniary reasons being the primary driver of the business start up decision. Combining the first and second reports, over half of all respondents in all samples stated that non pecuniary benefits were an important component of their start up decision.

The second most common response for the business start up motivation was having a good business idea/creating a new product. Roughly 30 percent of first reports and roughly 38 percent of combined reports referred to the fact that the reason the business was started was because of a good business idea or a new product. Many people also reported that they wanted to “generate income”. Answers in this broad category represented roughly 20 percent of first reports and 32 percent of combined reports. Finally, very few people reported starting the business because of a lack of other employment options.<sup>20</sup>

In the remainder of this section, we explore to what extent the respondents’ reported motives can predict their expected and actual values of growth and innovation measures. We focus on two motives in particular: new business idea and non pecuniary. The first is the motive most closely associated with the traditional role of an entrepreneur whereas the second is typically ignored or only considered anecdotally. To do this, we define a dummy variable for each motive that is equal to one if that motive was identified in either the first or second mention. Then we run a simple regression of the various measures described in Tables 7 and 8 from the

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<sup>20</sup> Ardagna and Lusardi (2008) show that the lack of employment options is a much more important motivation for starting a small business in developing economies.

PSED on the two dummy variables.<sup>21</sup> Note that since a motive can be identified in either mention, it is possible for both dummies to be equal to one. The results to these regressions are shown in Tables 10a and 10b. We only show these results for the first two PSID samples (in Tables 10a and 10b, respectively). Given the small sample size for the third sample (those that are still earning revenues in 2010), power is an issue for the interpreting the coefficients. We do wish to note, however, that even in this sample the patterns for the signs of the coefficient were very similar to what are shown for the other samples in Tables 10a and 10b.

For each sample in Table 10, we show five sets of results. The first column is the constant from the regression and represents the unconditional mean for those individuals who never report starting a business for either "non pecuniary" or "create a new product" motives. The next two columns show the coefficients on the two dummy variables for the reason that the business was started. These coefficients can be interpreted as the percentage difference in probability of the outcome (or difference in employment forecast) relative to respondents that mention *neither* business idea or non pecuniary motives.<sup>22</sup> In the fourth column, we show the difference in the coefficient on the non pecuniary motivation dummy (column 3) relative to the coefficient on the business idea motivation dummy (column 2). This can be interpreted as the difference in probability of the outcome (or employment) for those that mention exactly one of the motives. For example, respondents who specified a business idea and did not mention non pecuniary motives were 13 percent less likely than those that specified non pecuniary motives

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<sup>21</sup> Estimating the saturated version of this regression with an interaction term had almost no effect on the point estimates and p-values shown in Tables 10a and 10b. We also estimated the same regression with each category that could be named in either mention represented. This also did not change the results.

<sup>22</sup> Respondents that mention neither motive, would have specified either for income reasons, lack of other options, or some other motive. The vast majority of these cases specified income motives .

and not a business idea to enter a market already offering the same product or service In column 5, we show the p-value of a two-sided test for equality.

Individuals who start their business because they think they have a good idea or because they want to create a new product are much more likely to 1) want to grow, 2) want to innovate, and 3) actually innovate. Conversely, those who start for non pecuniary reasons are less likely to want to grow, less likely to want to innovate, and are less likely to actually innovate. As mentioned above, those with non pecuniary motives were much more likely to enter an already crowded market relative to those with a new business idea. Likewise, they were 5.1 percentage points less likely to report that they have already developed some proprietary technology or processes as part of their business start up and are 9.0 percentage points less likely to report expecting to get a patent, trademark, or copyright in the future. The p-values on both these differences are 0.01.

As can also be seen in Table 10, those who reported starting their business because they had a new idea were much more likely to want to be big in 5 years and to grow their business than those who started for non pecuniary reasons. For example, those who started because they had a good idea were 8.3 percentage points less likely to report wanting to remain small opposed to growing the business.

We wish to highlight a few additional results not shown in Table 10. First, there is little statistical difference in survival rates to 2010 for those who reported non pecuniary benefits as a primary motivation of starting the business relative to those who reported a new idea as the reason they started. If anything, in some samples and specifications, those that reported non

pecuniary benefits as a primary motivation survived with a higher probability.<sup>23</sup> Second, there is no statistical difference of actual firm size across the different groups based on the reason they started the business in 2010. The reason for this is that nearly all firms have only 1 or fewer employees even four years after the business started. There is not much variation across the firms in this small sample of survivors. This is consistent with the results shown in 3 showing that most surviving firms remain really small. Finally, there is some variation across industries with respect to non pecuniary reasons being an important driver relative to wanting to create a new product. Specifically, those in the finance industry were statistically much more likely, relative to other industries, to have people report non pecuniary benefits be an important motive for starting in that industry. A similar pattern appears among those starting businesses in retail trade. Two industries where the dominant reason to start the business was because of a desire to create a new product/service was in manufacturing and wholesale trade. The data lack enough power to draw decisive conclusions about the other industries.

The results in this section show that there is substantial ex-ante heterogeneity across individuals in why they started their businesses. Only a fraction of firms start because they have a good business reason. However, these firms at the time of inception report a higher desire to grow and innovate and higher actual realizations of innovation. Many firms, however, report non pecuniary benefits as being an important driver of small business behavior. Incorporating such ex-ante heterogeneity into models of small business dynamics will almost certainly alter conclusions about the importance of ex-post measures of heterogeneity such as stochastic

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<sup>23</sup> This would be consistent with a model where non pecuniary benefits are a large part of the return to small business formation as shown in Pugsley (2011). In that model, individuals will be willing to stay in business even if they get a bad productivity draw because the pecuniary returns are just a small portion of the total return to business entry.

productivity draws or binding financial constraints. We turn to this discussion in the next section.

## **6. Why Heterogeneity in Starting Motives/Expectations Can Matter**

There are a number of reasons why ignoring the *ex-ante* heterogeneity in motives and expectations may matter. We sketch how this *ex-ante* heterogeneity confounds inferences in a number of relevant contexts. We consider two literatures: firm dynamics and the measurement of the private equity risk-return tradeoff. Finally, we also assess how our work relates to the recent papers documenting the nature and growth patterns of small businesses in developing economies.

### **A. Firm Dynamics**

In theoretical models, differences in employment growth across firms are attributed to either differences in entrepreneurial ability (e.g., Lucas, 1978), differences in realized productivity draws (e.g., Simon and Bonini (1958); Jovanovic (1982); Pakes and Ericson (1989); Hopenhayn (1992)), differences in access to capital markets (e.g., Evans and Jovanovic (1989); Vereshchagina and Hopenhayn (2009)), or some combinations of the above (e.g., Clementi and Hopenhayn (2006)). While all of the above highlights some potential drivers of firm dynamics, the results we document in the prior sections suggest that these stories are, at best, incomplete. It is not only differences in luck, talent, or credit market access are the only determinants of firm size. As we show above, there is also substantial *ex-ante* heterogeneity in the desires and expectations of new business owners with respect to their growth process. In other words, some firms do not grow or innovate simply because they do not want to grow or innovate.

What drives these differences in *ex-ante* expectations and desires across owners of newly formed firms with respect to their desire to grow or innovate? The results in the prior sections point to at least two potential channels. First, many small business owners start their businesses,



in part, because of the non pecuniary benefits associated with small business ownership. As seen from the PSED data, many small business owners report starting their business because they value the control and flexibility provided by small business ownership. If these benefits diminish with firm size, individuals who start for these reasons will prefer to keep their businesses small. We do find evidence of such correlations in the data: those business owners that report starting their business in part for non pecuniary reasons were much more likely to want to keep their firm size small well into the future.

Second, some businesses may stay persistently small because they are in industries which have low natural efficient scales. Many small businesses are dentists, plumbers, real estate and insurance agents, small shop keepers, and beauticians. Within these industries, the productivity of the firm is directly linked to the individual's skill set. Given the fixed costs of production may be small relative to the variable costs, optimal firm size may be quite small. As a result, firms may start with no expectations of growth given that their natural scale is quite low.<sup>24</sup> These firms may be particularly attractive to business owners driven by non pecuniary motives.

Pugsley (2011) and Pugsley and Hurst (2011) formalize the insights put forth in this paper by writing down models of small business formation and small business dynamics where individuals are allowed to have differential utility from small business ownership and industries differ in their natural returns to scale. In these models, they show that many of the predictions of the standard models of firm dynamics can be replicated in a model with no differences across firms in entrepreneurial ability and no difference across firms in their financing constraints.

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<sup>24</sup> This idea is consistent with recent research by Holmes and Stevens (2010) which attributes the variation in firm size within narrowly defined manufacturing industries to differences between large plants who produce standardized goods and small plants that make custom or specialty goods. Similar differentiated product stories can also potentially explain the within industry size variation in other narrow industries like retail (big box stores versus smaller mom and pop stores), health care (small doctor practices versus hospitals), or lawyers (small law offices versus big corporate law firms). Explaining the variation in within industry firm size is an interesting avenue for future research.

There are two important results from these papers. First, Pugsley and Hurst (2011) show that the existence of non pecuniary benefits can generate a positive relationship between wealth and starting a business, by making business ownership a normal good, where wealthier individuals “purchase” these benefits as their marginal utility of consumption diminishes. Second, Pugsley (2011) shows that there is not a one-for-one mapping between the distribution of firm size and productivity draws (like the ones emphasized in much of the literature outlined above) when industries differ in their fixed costs and owners have a preference for keeping their business small, which cautions against using unconditional firm level dynamics to estimate a process for entrepreneurial productivity.

Finally, much of the empirical work on firm dynamics proceeds by studying either the universe of firms, or focuses specifically on a sector thought to be representative of that universe. Typically, this is the manufacturing sector where micro-level administrative data have historically been the most available. It is in this empirical context where the applicability of “Gibrat’s” law, which states firm growth rates are on average independent of size, or why the distribution of firm sizes appears to follow a particular power law (“Zipf’s” law) are frequently demonstrated.<sup>25</sup> Why these empirical regularities appear at the aggregate level is an interesting question. However, consistent with Pugsley (2011) it does not suggest that imposing this structure on a particular industry, or assuming a representative industry typified by manufacturing, is appropriate. The concentration of small businesses in industries varies considerably, and the heterogeneity we consider is especially important for industries we

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<sup>25</sup> See, for example, Sutton (1997) and Gabaix (2008).

highlight in this paper. There is considerable cross industry variation in the distribution of firm sizes, even conditional on average firm size.<sup>26</sup>

## **B. Understanding the Risk-Return Tradeoff**

There is a separate literature assessing the risk-return trade off of small business owners. For example, Moskowitz and Vissing-Jorgensen (2002) document that the returns to investing in private equity (business ownership) are no higher than the returns to investing in public equity despite the poor diversification and higher risk. Their focus is only on the pecuniary returns of private business investment. This spans a large class of businesses, many of which are the small businesses we study here. However, even among venture-backed startups, which are a tiny fraction of small businesses, the risk-return tradeoff looks poor. Hall and Woodward (2010) show that even among the highly skilled population of venture-backed entrepreneurs, potential entrepreneurs would be roughly indifferent between salaried employment and launching a venture-backed startup considering the high idiosyncratic risk of the payoffs to entrepreneurship

Not surprisingly, a model with non pecuniary benefits can help to explain these findings. If there are private benefits to small business ownership (relative to allocating effort to the labor market), the measured pecuniary return could be lower than the total return. Our results above suggest that for many individuals, non pecuniary benefits are an important motive for starting their small business. While the results above are based on survey reports, they are consistent with the work of Hamilton (2000) that shows the median small business owner receives lower accumulated earnings over time relative to paid employment.<sup>27</sup>

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<sup>26</sup> For example, Figure 3 highlights these patterns at broad industry groupings.

<sup>27</sup> Hamilton (2000) does not take into account of income underreporting by the self employed when performing his analysis. Hurst, Li, and Pugsley (2011) show that such income underreporting by the self employed is important. Although, the results of Hamilton are mitigated when income underreporting is account for, it still appears that the median self employed individual takes a pecuniary earnings loss when becoming self employed.

Overall, our results suggest that for many individuals, non pecuniary benefits could be an important factor driving their small business formation. Incorporating such preferences into our models of small business formations can alter our assessment of the risk-return tradeoff of small business ownership.

### **C. Small Businesses In Developing Economies**

Recent work has emphasized the fact that most small businesses in developing economies do not grow, do not innovate, and are started because of a lack of jobs in the larger firms within the economy. For example, La Porta and Shleifer (2008) examine the importance of the informal sector in developing economies. They conclude that, on average, the small firms that populate the informal sector in developing economies are much less productive than similar small firms in the formal sector. As a result of the low quality of the inputs into production (including human capital), it is not surprising that the small firms in the informal sector do not grow or innovate in any observable way. Banerjee and Duflo (2011) document the existence of "reluctant entrepreneurs" in developing economies. They find that most individuals who own a small business in the developing countries they analyze do not grow, are not profitable, and often do so because of the lack of jobs in larger, established firms.

The results in our paper both complement this literature and show that different mechanisms are at play in a developed country like the United States. In terms of similarities with the literature on small businesses in developing economies, it is true that most small businesses in the U.S. do not grow. However, the reason that small business seem to exist and the nature of the small business owners seem quite different. In the U.S., many of the small business owners are highly skilled (lawyers, doctors, dentists, etc.). It is a well established fact that there is little relationship between formal years of schooling and the propensity for either

small business entry or survival.<sup>28</sup> Additionally, as we have shown above, very few of the small business owners in the U.S. (less than 4 percent) report starting a business because of a lack of employment options. In other words, it does not appear that the U.S. small business owners are "reluctant entrepreneurs".

Overall, our results showing that most small business in the U.S. do not want to grow or innovate is consistent with small businesses in developing economies, the underlying reasons for this may be very different. A more formal analysis of the similarities and differences between small businesses within developed and developing economies would be a worthy area for future research.

## **7. Policy Implications**

Economic arguments for subsidizing small businesses hinge on small businesses being important contributors to aggregate innovation and growth where market forces alone fail to allocate sufficient resources to the sector. Market failures may stem from technological spillovers ignored by entrepreneurs or financial constraints that inhibit an optimal quantity of capital from reaching the small business sector. The subject of entrepreneurship and technological spillovers is well studied in the endogenous growth literature (e.g. Audretsch et al. (2006), Acs and Audretsch (2009)). If a substantial portion of R&D occurs in small firms, the social returns to entrepreneurship could far exceed the private returns. Jones and Williams (1989), for example, find the optimal level of investment in R&D to be 2 to 4 times the observed level of investment. Additionally, subsidizing small businesses may be appropriate if liquidity constraints or other financial market imperfections prevent small businesses from securing the financing they need to bring their innovations to market (Evans and Jovanovic (1989); Evans and Leighton (1989)).

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<sup>28</sup> See, for example, Evans and Leighton (1989) or Asoni (2011).

Given the belief that there are social spillovers from small business innovation or that small businesses face liquidity constraints, many developed economies enact policies that favor small businesses relative to established firms. The subsidies to small businesses could come in two potential forms. First, there may be direct subsidies to small businesses where the explicit intent is to promote small business activity. Within the United States, for example, small business subsidies include providing subsidized or guaranteed loans to small businesses, providing small businesses with access to special lending programs, exempting small businesses from various regulations, providing small businesses preferential treatment when awarding government contracts, and providing small businesses with preferential treatment through the tax code.<sup>29</sup> Adam Looney, in his discussion of our paper that follows, discusses a number of these government mandated small business subsidies in the United States. These direct small business subsidies are usually linked explicitly to firm size. Firms with less than a certain amount of employees are eligible for the subsidy while firms with more than a certain amount of employees are not eligible for the subsidy. As a result, many of the small business subsidies promote small business entry but do not promote small business growth because if the firms grow beyond a certain size the subsidy no longer applies.

Second, there also are indirect subsidies that can promote small business activity. For example, the fact that non pecuniary attributes are not taxed results in sectors where non pecuniary benefits are a larger fraction of total compensation being tax preferred relative to other sectors. To the extent that small business ownership offers larger non pecuniary benefits relative to owning a larger business or being a wage worker, the small business sector would be tax preferred even if there are no other direct subsidies. Additionally, there is a large literature

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<sup>29</sup> See De Ruyg (2005) for a detailed discussion of the various ways the U.S. government provides subsidies to U.S. small businesses.

showing that small business owners are much more likely to underreport their income to tax authorities relative to wage and salary workers.<sup>30</sup> Again, if it is easier to underreport income to tax authorities if one owns a small business, the small business sector again would be tax preferred relative to other sectors even if there are no additional direct small business subsidies. The point we want to emphasize in this section is that while policy makers and researchers often invoke the potential benefits of direct small business subsidies, there is very little quantitative research documenting the actual benefits and costs of small business subsidies. The results in our paper suggest that the potential costs may be nontrivial.

The potential costs associated with small business activity come from two sources. First, as we show above, the bulk of small businesses report ex-ante that they do not want to grow nor do they want to innovate. And, as anticipated, most small firms do not grow or innovate. Linking small business subsidies to firm size may support the handful of firms that eventually turn into Google or Microsoft, but they also stimulate real estate agents, small law firms, and construction workers where the social spillovers and growth potential may be much smaller. To the extent that these subsidies alter the behavior of firms who start for reasons unrelated to growth and innovation, the policies can be distortionary by allocating more resources to the small business sector than would be otherwise optimal. Second, as mentioned above, the structure of most current direct small business subsidies is to link the subsidies to firm size. As a result, if the benefits associated with subsidizing small business activity comes from the small businesses actually growing, the policies, as currently structured, may actually inhibit firm growth. If a firm grows beyond a certain size, the small business subsidy no longer applies.

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<sup>30</sup> See Hurst, Li, and Pugsley (2011) for a recent discussion of this literature.

In a companion paper, Pugsley and Hurst (2011) illustrate the potential costs of small business subsidies in a simple static general equilibrium model of small business formation and occupational choice. Within the model, industries differ by their natural return to scale. Households differ by the size of the non pecuniary benefit they receive (in flow utility) from starting their own business. To highlight the potential costs of subsidizing small business activity in the model, we assume that there are no differences across individual in their talent, there are no social spillovers from small business formation and there are no liquidity constraints preventing firm formation. These extreme assumptions allow us to focus on potential costs of subsidizing small businesses in a world where individuals get non pecuniary benefits from small firm ownership. Individuals in the model can either allocate their labor to running a business or working for some other business. Household run businesses cannot grow to their efficient scale without forfeiting the utility flow.

The model makes many predictions which can inform researchers and policy makers about the potential costs of small business subsidies. First, subsidizing small business (funded with taxes on labor income) will distort the allocation of production within the economy to smaller scale businesses. Individuals choosing to start a small business trade-off the size of their non pecuniary benefits from owning a small business with the loss in wages they would incur from foregoing the benefits of agglomeration. When small business activity is directly subsidized, the economy as a whole becomes less productive given the response of individuals to work in small (subsidized) self-owned firms as opposed to establishing larger firms which can produce at lower average costs by taking advantage of the returns to scale. Notice, such distortions could occur even in a world where there are no direct subsidies to small businesses and only the indirect subsidies discussed above.



Moreover, in such a model where the non pecuniary benefit of small business ownership is a normal good, the subsidies to small businesses are regressive. The reason for this is that the high wealth individuals are going to be the ones that are much more likely to start a business in the no subsidy world because they are more able to afford (in utility terms) the foregone benefits of agglomeration when they start their business. For the wealthy, the small business subsidy is simply a transfer tied to activity that they were more likely to do anyway. Not only do the existence of non pecuniary benefits to small business ownership result in subsidies being welfare reducing, lower wealth households suffer more from the subsidy than do higher wealth households.

To our knowledge, there is no empirical work that evaluates whether subsidizing small businesses is a positive net present value venture. Addressing this question seems like a very important area for future research. Our work suggests that subsidies may be less distortionary if they were targeted at growth and innovation as opposed to being mostly linked to firm size. Such policies could address the concerns raised by our results in at least two ways. First, we show that most small businesses operate in industries with potentially smaller natural scales. Business owners with little intention to grow or innovate may select into these industries for that very reason. By focusing the subsidy on the intensive margin, the subsidy is more likely to be taken up by a business owner focused on growth or innovative activity. Subsidies could lower the cost of credit for existing firms, and by increasing their value entice productive entrepreneurs with high wage employment opportunity costs. Second, if non pecuniary compensation is independent of the scale of the firm, the incidence of an expansion subsidy would be undistorted by non pecuniary benefits. If anything, non pecuniary benefits may help separate businesses that want to grow from businesses that would prefer to remain small. Of course there may be other

social virtues to non-innovative small businesses, such as supporting communities and neighborhoods, which are aided by subsidizing the entry and exit margins. However, when targeting job creation or innovative risk taking, our findings suggest caution when supporting businesses purely by size. At a minimum, future research is necessary to better understand both the costs and benefits of subsidizing small business activity.

## **8. Conclusion**

In this paper, we have shown that there is substantial skewness in the desires and expectations of individuals who start small businesses. Specifically, the vast majority of small business owners do not expect to grow, report not wanting to grow, never expect to innovate along observable dimensions, and report not wanting to innovate along observable dimensions. We also show that there is also substantial heterogeneity in the reported reasons for why individuals start their business. In particular, only about one-third of new businesses (on the eve of their start up) reported that they were starting their business because they have a product or service that they want to bring to market. Instead, the most common response for why individuals were starting their business was the existence of non pecuniary benefits. Individuals reported that they liked being their own boss and like the flexibility that small business ownership provided.

Our results suggest that much of the current literature has overlooked an important component of many small businesses. Essentially all of the current literature on firm dynamics explains the ex-post distribution of firm size with models emphasizing differences in entrepreneurial talent, differences in entrepreneurial luck, and differential access to credit markets. The results in this paper, however, suggest that another factor may be at play: many small business owners just do not wish to grow big or innovate along observable dimensions in any meaningful way. The paper shows two potential reasons for the ex-ante differences in

desires and expectations with respect to future growth. First, the natural scale of some industries may be quite small. For example, the fixed costs to be a plumber, barber, lawyer, or insurance agent may be small relative to the variable costs making the returns to scale quite small. Second, the existence of non pecuniary benefits of owning a small business (because of increased flexibility and control) may cause individuals to forgo some natural benefits of agglomeration in exchange for higher utility. Regardless of the exact reason, most individuals who start their small business have little desire or expectation to grow their business beyond having a few employees.

Recognizing these characteristics common to many small businesses has immediate policy implications. Often subsidies targeted at increasing innovative risk taking and overcoming financing constraints are focused on small businesses. Our analysis cautions that this treatment may be misguided. We believe that these targets are better reached through lowering the costs of expansion, so they are taken up by the much smaller share of small businesses aspiring to grow and innovate. In fact, the US Small Business Administration already partners with venture capitalists whose high powered incentives are aligned with finding these small businesses with a desire to be in the tail of the firm size distribution. We also think a missing component of the academic and policy discussion is a formal cost-benefit analysis associated with small business subsidies. To do this, more work is needed on the potential frictions to small business growth and on the externalities associated with small business growth.

Lastly, we conclude that our results suggest that it is often inappropriate for researchers to use the universe of small business (or self employment) data to test standard theories of entrepreneurship. Most small businesses do not match our conceptual measures of entrepreneurship which focuses on the desire to innovate or grow. Researchers interested in

testing such specific theories of entrepreneurship may need to use more specialized data sets like the ones that track small businesses seeking venture capital funding.

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**Table 1: Share of Small Businesses Within Narrow 4 Digit NAICS Industries Based On Rank**

<b>Rank</b>	<b>4 Digit NAICS Industry</b>	<b>Percent of Small Businesses</b>	<b>Cum. Percent</b>	<b>Rank</b>	<b>4 Digit NAICS Industry</b>	<b>Percent of Small Businesses</b>	<b>Cum. Percent</b>
1	Residential Build. Const. (2361)	3.5	3.5	21	Arch/ Engineering Serv. (5413)	1.7	49.0
2	Offices of Physicians (6211)	3.2	6.7	22	Oth. Spec. Trade Contr. (2389)	1.7	50.7
3	Legal Services (5411)	3.2	9.9	23	Activ. Rltd to Real Estate (5313)	1.3	52.0
4	Build. Equip. Contractors (2382)	3.1	13.0	24	Gasoline Stations (4471)	1.3	53.3
5	Religious Organizations (8131)	3.0	16.0	25	Oth. Prof., Sci, Tech. Svcs (5419)	1.1	54.4
6	Svcs to Build. and Dwellings (5617)	3.0	19.0	26	Grocery Stores (4451)	1.1	55.5
7	Auto Repair and Maint. (8111)	2.7	21.7	27	Bus/Prof/Labor/Politic Org (8139)	1.1	56.6
8	Limited-Svc Eating Places (7222)	2.6	24.3	28	General Freight Trucking (4841)	1.0	57.6
9	Full-Service Restaurants (7221)	2.6	26.9	29	Wholesale Electronic Mkts (4251)	1.0	58.6
10	Mgmt/Sci/Tech. Consult. (5416)	2.5	29.4	30	Amusement and Recr. (7139)	1.0	59.6
11	Insurance Agencies (5242)	2.3	31.8	31	Child Day Care Services (6244)	0.9	60.5
12	Build. Finishing Contractors (2383)	2.3	34.1	32	Spec. Freight Trucking (4842)	0.9	61.4
13	Offices of Dentists (6212)	2.2	36.2	33	Drinking Places (Alch.) (7224)	0.8	62.2
14	Other Health Practitioners (6213)	2.0	38.2	34	Other Fin/Invest Activities (5239)	0.8	63.0
15	Found/Struct/Build. Contr. (2381)	1.9	40.1	35	Health and Pers. Care Store (4461)	0.8	63.8
16	Accounting Services (5412)	1.9	42.0	36	Clothing Stores (4481)	0.7	64.5
17	Real Estate Agnt and Brokers (5312)	1.8	43.9	37	Build. Material Dlrs (4441)	0.7	65.2
18	Computer Systems Design (5415)	1.8	45.6	38	Nonres. Build. Constr. (2362)	0.7	65.9
19	Personal Care Services (8121)	1.7	47.3	39	Mach/Equip/Supl Whsle (4238)	0.7	66.6
20	Lessors of Real Estate (5311)	1.7	49.0	40	Other Misc. Retailers (4539)	0.7	67.3

Note: The table shows the results of taking all small businesses (specifically firms with fewer than 20 employees) in the 2007 Economic Census and segmenting them by their 4 digit NAICS industry code. The specific NAICS codes are shown in parenthesis. We then rank the industries based on the number of small businesses in that industry relative to all small businesses in the data. Given there are 294 4-digit NAICS industry codes, we rank the firms from 1 through 294. The table lists the top 40 industries.



**Table 2a**  
**Small Businesses Out of All Firms, By Firm Age and Industry,**  
**2005 Business Dynamic Statistics Data**

Industry	Firm Age		
	0-10 Years Old	10-25 Years Old	All Firm Ages
All	92.0	85.7	87.2
FIRE	95.5	91.8	91.9
Agriculture	94.8	88.1	91.6
Construction	93.7	86.0	88.9
Wholesale Trade	93.0	83.2	84.1
Services	92.7	88.4	89.1
TCU	92.3	82.2	86.0
Retail	88.6	81.8	84.6
Manufacturing	85.5	71.5	72.4

**Table 2b**  
**Small Business Employment Out of All Employment, By Firm Age and Industry,**  
**2005 Business Dynamic Statistics Data**

Industry	Firm Age Categories		
	0-10 Years Old	10-25 Years Old	All Firm Ages
All	44.8	24.7	19.4
FIRE	50.8	31.7	19.0
Agriculture	57.7	47.1	50.1
Construction	59.1	38.4	39.4
Wholesale Trade	52.8	30.6	21.7
Services	40.7	23.1	20.8
TCU	44.2	14.7	11.8
Retail	46.9	24.8	18.8
Manufacturing	34.6	16.0	8.5

Notes: All data in Tables 2a and 2b can be found at [http://www.ces.census.gov/index.php/bds/bds\\_database\\_list](http://www.ces.census.gov/index.php/bds/bds_database_list). The industry classifications are the ones provided by the Business Dynamic Statistics (BDS). Like the Statistics on U.S. Business (SUSB) data, the BDS data only includes information on firms with paid employees. The data in each column of Table 2a should be read as the percent of small business firms in a given firm age and industry grouping out of all firms in that firm age and industry grouping. Table 2b is analogous except it is for employment instead of firms. In these tables, we define small businesses as firms with fewer than twenty employees.

**Table 3: Change in Employment By Existing Small Businesses, By Firm Age,  
2003 Survey of Small Business Finances Data**

Direction of Emp. Change	Percent Changing Employment Over Last 1 Year				Percent Changing Employment Over Last 3 Years			
	Age of Firm				Age of Firm			
	1-10 Years	11-20 Years	20+ Years	All	1-10 Years	11-20 Years	20+ Years	All
Increase Employment	18.9	10.6	9.1	13.9	27.6	19.4	15.3	21.3
No Change in Employment	74.3	79.7	84.0	78.4	61.0	65.0	72.5	65.6
Decrease Employment	6.8	9.8	6.9	7.7	11.3	15.7	12.2	13.1
Sample Size	1,163	817	727	2,707	847	818	725	2,386

**Table 4: Change in Employment By New Businesses, By Firm Age,  
Kaufman Firm Survey Data**

	Percent Changing Employment Over Last 4 Years		
	Percent With $\Delta$ Employment > 1 Employee	Percent With $\Delta$ Employment > 5 Employees	Percent With $\Delta$ Employment > 10 Employees
All New Firms	41.9	10.8	3.6
Sample Size	2,617	2,617	2,617

Notes: See text for a description of both the 2003 SSBF sample (used in Table 3) and the KFS sample (used in Table 4). We restricted the SSBF to focus only on those firms with fewer than 20 employees. For the KFS sample, we looked at all new firms regardless of firm size. However, we did restrict the KFS sample to only those firms that remained in business for the four years since the survey started. The median and mean number of employees for the firms in the KFS sample was 1 and 3, respectively. The 90<sup>th</sup> percentile of number of employees for the firms in the KFS sample was 14. All data was weighted using the sample weights provided within the survey.

**Table 5: Using Industry Share of Small Businesses to Predict Small Business Job Creation and Destruction  
Pooled 2003 to 2006 Statistics of U.S. Businesses Employment Change Data**

	(1)	(2)	(3)	(4)	(5)
	Small Bus. Gross Job Creation Rate	Small Bus. Gross Job Creation Rate	Small Bus. Gross Job Creation Rate	Small Bus. Gross Job Birth Rate	Small Bus. Gross Job Destruction Rate
A. Equally Weighted					
Industry Share of Small Firms	-2.14 (0.25)	-1.98 (0.23)	-2.05 (0.29)	0.10 (0.17)	-0.23 (0.17)
Observations	929	929	652	666	656
R-squared	0.077	0.093	0.205	0.351	0.353
B. Weighted by Number of Small Firms within Industry					
Industry Share of Small Firms	-0.73 (0.00)	-0.73 (0.00)	-0.73 (0.00)	0.03 (0.00)	0.04 (0.00)
Observations	929	929	652	666	656
R-squared	0.42	0.421	0.437	0.588	0.531
Controls					
Industry Gross Job Creation	Yes	Yes	Yes		
Industry Gross Job Births		Yes		Yes	
Industry Gross Job Destruction		Yes			Yes
Time Effects	Yes	Yes	Yes	Yes	Yes

Notes: The table reports estimation results of five specifications estimated with and without firm frequency weights. The regressions are small firms (firms with between 1 and 19 employees) gross job creation rate (columns 1-3), gross job birth rate (column 4), and gross job destruction rate (column 5) on the industry's share of small firms out of all small firms. The unit of observation is 6-digit industries. The regression assesses, for example, whether the gross job creation rate of small firms within a narrow industry is related to the industry's share of small firms out of all small firms. Data for these regressions come from the pooled 2003-2006 SUSB data. All regressions included time effects. Other controls are listed on the table (when included). Robust standard errors are in parentheses. The weighted estimation can be viewed as a grouped data estimate of firm level job creation/destruction from administrative records if employment shares of small firms within an industry are approximately equal.

**Table 6**  
**Innovation Behavior of New Businesses**  
**Kaufman Firm Survey Data**

	Measure of Innovative Activity By Year 4			
	Percent of Firms Who Have or Are Applying for a Patent	Percent of Firms Who Have or Are Applying for a Copyright	Percent of Firms Who Have or Are Applying for a Trademark	Percent of Firms Who Have Either a Patent, a Trademark, or a Copyright
All New Firms	2.7	8.9	12.3	17.3
Sample Size	2,581	2,550	2,546	2,510

Notes: Data are from the 2004-2008 Kaufman Firm Survey (KFS). Sample sizes differ slightly over the responses due to different response rates for different questions. See the text for a full discussion of the KFS. All data are weighted using the provided survey weights.

**Table 7**  
**Innovative Activities of New Business Owners**  
**PSED Data**

	First Year of Business (2006)		Fifth Year of Business (2010)
	Sample 1: All	Sample 2: Positive Revenues	Sample 3: Positive Revenues
Percent of Firms that Already Developed Proprietary Technology, Processes, or Procedures	6.5	8.3	20.3
Percent of Firms that Already Applied for Patent, Copyright, or Trademark	4.9	6.0	17.6
Percent of Firms Stating That Many Existing Firms Already Offer Same Product/Service to Customer Base	35.7	43.3	39.6
Percent of Firms Stating That No Existing Firms Offers Same Product/Service to Customers	19.2	13.3	17.3
Sample Size	1,214	602	162

Notes: This table summarizes the responses to the questions asked of the nascent small business owners in the PSED about their actual and expected innovative activities. See text for the details. We focus on three samples. The first sample is all PSED respondents of nascent small business owners. The second sample is the set of all nascent entrepreneurs who actually had positive revenues during 2006 (first wave of the survey). The third sample is the set of all nascent entrepreneurs who actually had positive revenues during 2010 (most recent follow up wave of the survey). All data are weighted using the PSED sample weights from their respective survey wave. Responses for samples 1 and 2 are from the initial wave. Responses for sample 3 are from fifth wave.

**Table 8**  
**Ex Ante Expectations and Desires About Future Firm Growth and Innovation**  
**PSED Data**

	Sample 1: All PSED Respondents	Sample 2: Positive Revenues In First Year (2006)	Sample 3: Positive Revenues in Fifth Year (2010)
Percent of New Firms That Report That They Want to Be “Big”	24.3	23.0	28.3
Expected Number of Employees Working in Firm When it is 5 Years Old (25 <sup>th</sup> percentile)	1	0	0
Expected Number of Employees Working in Firm When it is 5 Years Old (Median)	4	3	3
Expected Number of Employees Working in Firm When it is 5 Years Old (75 <sup>th</sup> percentile)	10	8	6
Expected Number of Employees Working in Firm When it is 5 Years Old (90 <sup>th</sup> percentile)	29	24	25
Percent of Firms that Expect To Develop Proprietary Technology, Processes, or Procedures in Future	14.6	9.2	12.2
Percent of Firms that Expect to Apply for Patent, Copyright, or Trademark in Future	26.0	17.9	24.9
Percent of Firms that Expect R&D Spending Will Be a Major Priority for Business	25.7	19.5	22.8

Note: Data comes from the PSED. See text for the details of the survey and details about the individual questions summarized in the table. We focus on three samples. The first sample is all PSED respondents of nascent small business owners. The second sample is the set of all nascent entrepreneurs who actually had positive revenues during 2006 (first follow up wave of the survey). The third sample is the set of all nascent entrepreneurs who actually had positive revenues during 2010 (most recent follow up wave of the survey). All data are weighted using the PSED sample weights from their respective survey wave. Sample sizes differ slightly from those in Table 7 because not all respondents provided responses to all the questions. However, the differences in sample sizes were small when they existed.

**Table 9**  
**Importance of Non Pecuniary Reasons for Starting a Business by Nascent Entrepreneurs**  
**PSED Data**

Reason For Starting Business (Up to Two Reasons Provided)	I. Sample: All Respondents (1,214 obs.)		II. Sample: Respondents With Positive Revenues In 2006 (602 obs.)		III. Sample: Respondents With Positive Revenues In 2010 (162 obs.)	
	A. First Report	B. Any Report	A. First Report	B. Any Report	A. First Report	B. Any Report
Non Pecuniary Reasons	35.3	50.5	37.6	53.9	35.0	52.4
To Generate Income	19.5	34.1	21.4	36.6	17.6	32.4
Had A Good Business Idea/Create New Product	32.2	40.6	28.3	34.9	33.8	37.5
Lack of Other Employment Options	2.2	3.8	2.6	4.0	2.6	4.3
Other	10.8	15.7	10.2	15.5	11.0	14.7

Notes: The table uses the same dataset and sample construction as in Table 7. This table summarizes the responses to the questions “Why did you start this new business?” We classified the responses to the open ended question of “Why did you start this new business?” into five broad categories of response: non pecuniary responses, income reasons, having a good business idea, lack of other employment options, and other. For a complete discussion of our classification, see appendix Table A1. Respondents were allowed to provide up to two reasons for why they started the business. In columns A, we report the fraction of respondents who provided the specific reason on their first report. In columns B, we report the fraction of respondents who provided the specific reason on either their first or second report. The numbers in column B sum to fewer than 200 percent because about one-quarter of respondents did not provide a second report and, of those that did, some provided a report that was classified in the same broad category. All data are weighted using the PSED sample weights.

**Table 10a: Differences in Business Start Up Motivation and Expectations about Growth and Innovation Behavior, PSED Sample, All Respondents**

Dependent Variable	(1) Mean for Omitted Group	(2) Coefficient Create New Product	(3) Coefficient Non- Pecuniary	(4) Diff. (3) - (2)	(5) p-value of Diff.
Firms Stated That Many Existing Firms Already Offer Same Product/Service to Expected Customer Base	0.365	-0.082 (0.035)	0.049 (0.035)	0.131	<0.01
Firm Stated That No Existing Firms Offers Same Product/Service to Expected Customers	0.201	0.037 (0.029)	-0.049 (0.028)	-0.086	0.01
Firms Already Developed Proprietary Technology, Processes, or Procedures	0.082	0.010 (0.019)	-0.041 (0.018)	-0.051	0.01
Firms Expects to Apply for Patent, Copyright, or Trademark in Future	0.213	0.104 (0.034)	0.010 (0.033)	-0.094	0.01
Percent of New Firms That Report That They Want to Be “Big”	0.250	0.036 (0.035)	-0.047 (0.033)	-0.083	0.03
Expected Number of Employees Working in Firm When it is 5 Years Old (75 <sup>th</sup> percentile)	10.0	4.0 (2.3)	-2.0 (2.3)	-6.0	0.03
Expected Number of Employees Working in Firm When it is 5 Years Old (90 <sup>th</sup> percentile)	30.0	15.0 (5.3)	-10.0 (5.1)	-25.0	0.01

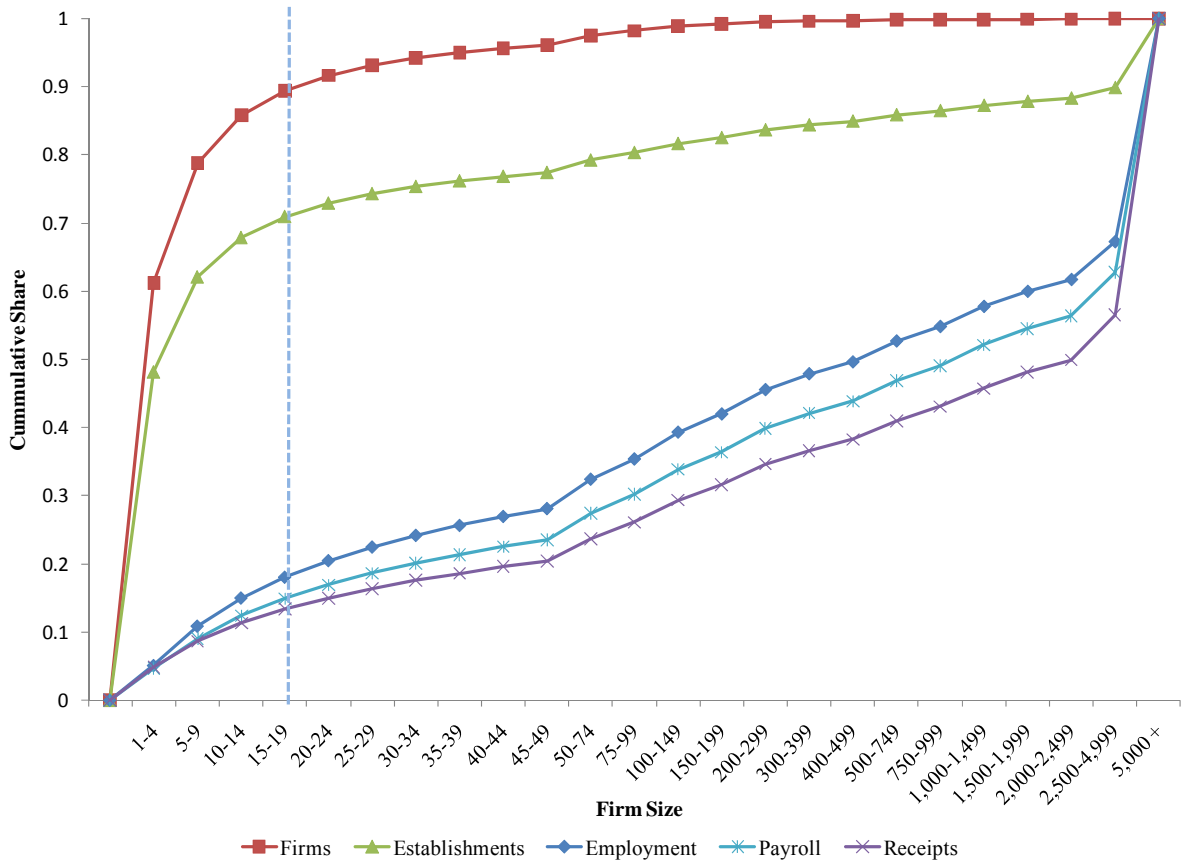
Notes: The results in Tables 10a and 10b are from a regression of different dependent variables indicating the business or the expectation about the business for future growth and innovation on a dummy for whether the respondent reporting starting the business because they wanted to create a new product (row 3 from Table 9) or because of non pecuniary reasons (row 1 of Table 9). For the regression, the dummy variable equals one if the respondent reported the given motive on either their first or second report. Columns 2 and 3 of this table show the coefficients on these dummy variables. Column 4 is the simple difference of these coefficients. Column 5 is the p-value on the difference. Column 1 shows the mean dependent variable for the omitted groups (the constant from the regression). Robust standard errors are in parentheses.



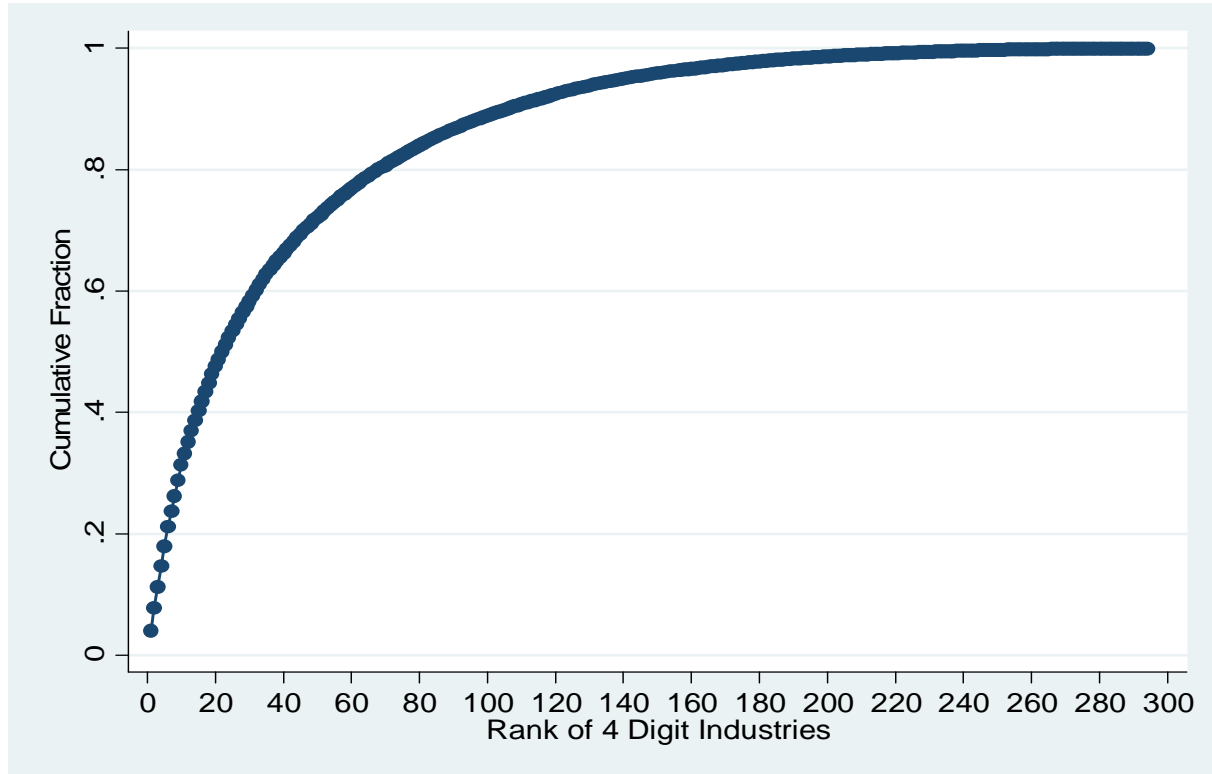
**Table 10b: Differences in Business Start Up Motivation and Expectations about Growth and Innovation Behavior, PSED Sample, Respondents who Had Positive Revenues in 2006**

Dependent Variable	(1) Coefficient Create New Product	(2) Coefficient Non- Pecuniary	(3) Diff. (2) - (1)	(4) p-value of Diff.
Firms Stated That Many Existing Firms Already Offer Same Product/Service to Expected Customer Base	-0.112 (0.053)	0.020 (0.051)	0.132	0.02
Firm Stated That No Existing Firms Offers Same Product/Service to Expected Customers	0.059 (0.041)	-0.024 (0.036)	-0.083	0.05
Firms Already Developed Proprietary Technology, Processes, or Procedures	0.027 (0.029)	-0.051 (0.028)	-0.078	0.02
Firms Expects to Apply for Patent, Copyright, or Trademark in Future	0.067 (0.045)	0.054 (0.041)	-0.013	0.77
Percent of New Firms That Report That They Want to Be “Big”	0.042 (0.049)	-0.028 (0.046)	-0.070	0.17
Expected Number of Employees Working in Firm When it is 5 Years Old (75 <sup>th</sup> percentile)	5.0 (1.1)	0.0 (1.1)	-5.0	0.01
Expected Number of Employees Working in Firm When it is 5 Years Old (90 <sup>th</sup> percentile)	20.0 (8.0)	-10.0 (7.7)	-30.0	0.01

**Figure 1: Share of Firms, Employment, Receipts, and Payroll Belonging to Different Firm Size Categories, 2007 SUSB**

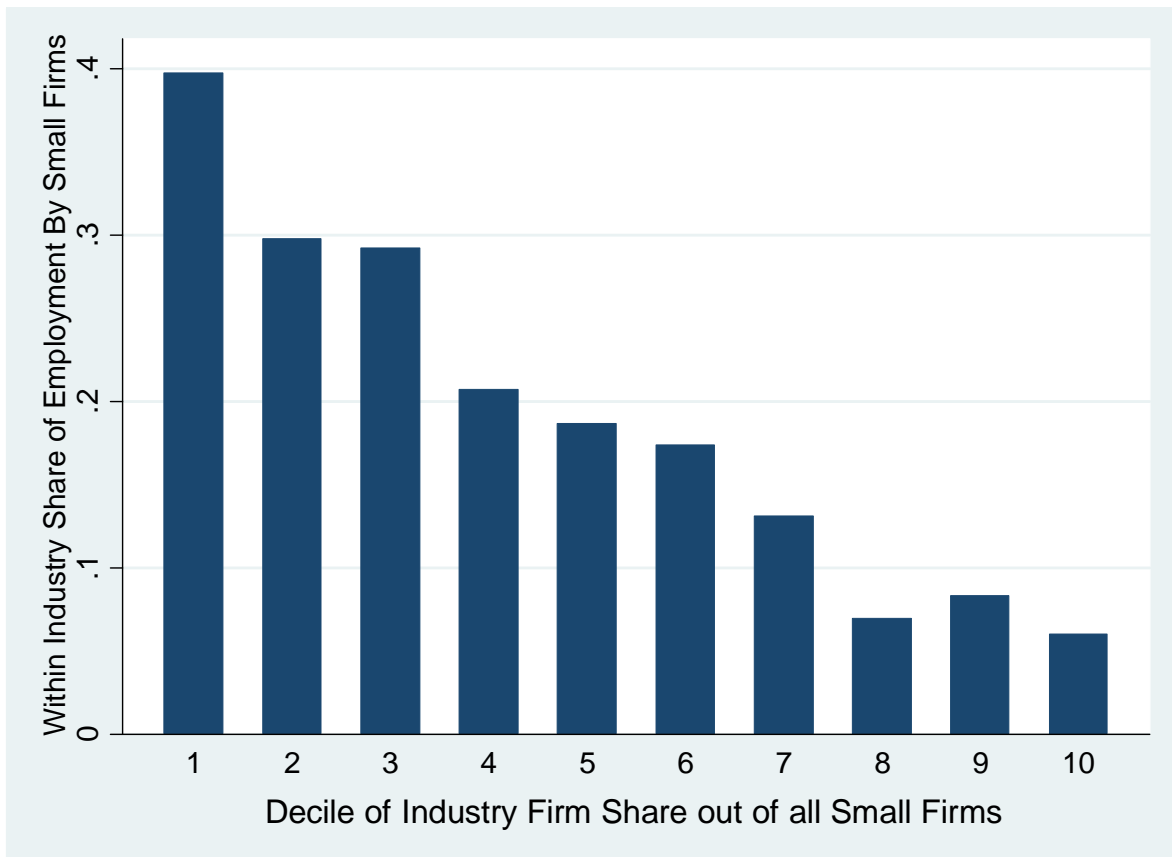


**Figure 2: Breakdown of Firms With Fewer than 20 Employees By 4 Digit NAICS Industry**



Note: Figure starts with the sample of all firms with fewer than 20 employees from the 2007 SUSB. These firms are then grouped by their 4 digit NAICS industry code. There are 294 such industries. Industries are then ranked by the fraction of small businesses (out of all small businesses) that are in each industry. A rank of 1 means that industry had the largest fraction of small businesses (out of all small businesses) in that industry. The rank is then plotted against the cumulative fraction of small businesses (out of all small businesses) in an industry of a given rank.

**Figure 3: Within Industry Share of Employment By Small Firms by Decile of Industry Share of Small Firms out of All Small Firms**



Notes: The y-axis in this figure is the average within industry share of employment by small firms across different industry deciles. The within industry share of employment by small firms is defined as  $y_j$  in the text. This measures the share of employment in small firms in industry  $j$  out of all employment in industry  $j$ . The x-axis are deciles based upon the share of firms from industry  $j$  out of all small firms (regardless of industry). This is defined as  $x_j$  in the text. This is the same metric used to rank firms in Table 1 and Figure 2. The sample includes all 294 4-digit industries. Each decile, therefore, includes roughly 29 industries. For example, decile 1 includes the top 29 industries from Table 1.

**Appendix Table A1: Industry Breakdown of Non-Employer Firms,  
2007 U.S. Non-Employer Statistics**

Industry	Fraction of Non Employers in Industry Out of All Non Employers
Professional, Scientific, and Technical Services	14%
Other Services (Except Public Administration)	14%
Construction	12%
Real Estate and Rental and Leasing	11%
Retail Trade	9%
Administrative and Support and Waste Management	8%
Health Care and Social Assistance	8%
Arts, Entertainment, and Recreation	5%
Transportation and Warehousing	5%
Finance and Insurance	4%
Education Services	2%
Wholesale Trade	2%
Manufacturing	2%
Information	1%
Accommodation and Food Services	1%
Agriculture, Forestry, Fishing and Hunting	1%
Mining, Quarrying, and Oil and Gas Extraction	0%
Utilities	0%

Notes: See <http://www.census.gov/econ/nonemployer/index.html> for data.

**Appendix Table A2:  
Classifications of Reasons Starting a Business Reported for  
Starting a Business by Nascent Entrepreneurs in the PSED**

**Non Pecuniary Reasons**

Be own boss; tired of working for others (80) (75)  
Flexibility ; more free time ; set own hours (26) (22)  
Stay home with children ; work from home (33) (12)  
Enjoy the work, have passion for it ; hobby (122) (96)  
Job security/Financial independence (34) (14)  
Try new career ; change career ; do something new (24) (10)  
Creative ; do creative work ; creative outlet (9) (5)  
Better life (3) (0)  
Life long ambition (24) (10)  
Challenge (3) (3)  
Personal Growth (2) (8)  
To do more fulfilling work (2) (3)  
Other lifestyle references (20) (7)  
Other work desirability references (20) (7)

**To Generate Income**

Income; To Make Money (117) (93)  
Extra Income (50) (20)  
Need Supplemental Income (8) (6)  
Retired – need to supplement income (8) (3)  
Income for educational expenses (1) (3)  
Income for retirement (11) (8)  
To leave business/money to children (5) (4)  
Unlimited income potential; good money (22) (19)  
Potential to make more money working for self (7) (12)  
Other income references (23) (22)

**Had A Good Business Idea/Create New Product**

Take advantage of opportunity (23) (17)  
High demand for products/business; satisfy need (75) (30)  
Market Opportunity; untapped market; shift in market (42) (17)  
New technology/product/service (110) (3)  
Good product/faith in product (13) (5)  
Expansion of old/current business (23) (2)  
Good Business Opportunity (1) (2)  
Lots of experience at this type of work; background in field; knowledge (129) (25)  
Have formal training/education in field (21) (13)  
Have talent in field, area of expertise; ability to do it (23) (23)  
Other business opportunity references (33) (21)

### **Lack of Employment Options**

Cannot find employment elsewhere; lost job (18) (8)  
Disabled/injured/sick and cannot work elsewhere (18) (12)  
Retired (14) (8)

### **Other**

Friend/family member had an idea and started a business (25) (9)  
Inheritance (5) (1)  
Believe in value of work ; think business is important (4) (1)  
Help others ; help community (32) (31)  
Aid in economy ; economic development (9) (1)  
Other reasons (51) (20)

Note: Table shows the grouping of PSED respondent answers to the following open ended questions: “Why do you/did you want to start this new business?” Each respondent was allowed to provide up to two responses. This question was only asked in the initial wave of the PSED. The PSED staff took the responses to the open ended questions and coded them into the 44 specific responses – all of which are listed in this table. In the codebook, the 44 responses were grouped into 6 broader categories. Those categories were “income”, “business opportunities”, “employment”, “personal reasons”, “lifestyle”, and “other”. For our purpose, this classification was not exactly ideal. For example, the personal reason category included both “lots of experience at this type of work” and “enjoy the work, have passion for it; hobby”. As a result, we reclassified the responses into the five categories above (used in Tables 9 and 10). Our classification was close to – but not identical to – the PSED classification. One can see the PSED code book for an exact comparison. Lastly, the numbers in parentheses represent the actual number of respondents who provided the reason on their first report (in the first parentheses) and on their second report (in the second parentheses). These numbers are for all PSED respondents and the sample from which they are drawn is analogous to the sample described in column 1 of Table 9. The numbers in the second parentheses sum to fewer than the full sample because roughly 500 respondents did not provide a second response.