Does Unemployment Insurance Change the Selection into Entrepreneurship? *

Johan Hombert[†] Antoinette Schoar[‡] David Sraer[§]

David Thesmar[¶]

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Abstract

The French Reform of 2003, documented in Hombert et al. (2014), led to 25% increase in supply of newly created firms. The question we investigate in this article is whether it led to a significant reduction in the potential for long-term success of new ventures. We proceed in two steps. First, using the 1994 cohort, we show that some entrepreneurial and project characteristics, that we can measure using a large-scale survey, significantly predict the probability that newly founded firms succeed in the long-run. We show that firms started by entrepreneurs that plans on growing, have already had entrepreneurial experience, or are motivated by new ideas, are significantly more likely to employ at least 50 persons after 12 years. We then use this relationship to see if the success potential of start-ups was significantly deteriorated by the 2003 reform. We find that it was not.

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[†]HEC Paris

[‡]MIT-Sloan, NBER, and CEPR

[§]Berkeley-Haas and NBER

[¶]MIT-Sloan and CEPR

Between 2003 and 2005, the pace of new firm creations rose by about 25% in France (see Figure 1). This change was induced by a major reform of the French unemployment insurance (UI) system, which led to increased protection of unemployed entrepreneurs against downside risk. Such protection was introduced via two changes. First, unemployed people who become entrepreneurs could retain their rights to unemployment insurance in case of failure for up to 3 years. Beforehand they would have lost all future claims to UI if they started a business. Second, unemployed entrepreneurs were allowed to keep their unemployment benefits *while* starting their own firm, and complement entrepreneurial income up to 70% of their pre-unemployment income. This reform led to massive entry of unemployed people into entrepreneurship in France (Hombert et al., 2014).

The problem, however, that some observes raised as a counter argument to the implementation of the reform is that the reform may change the composition of firms changing firms. In particular the concern was that greater downside, which means reduced failure risk, insurance might lead to an increase in "subsistence" entrepreneurship (small firms, with no ambition to grow) or less competent entrepreneurs starting a firm as opposed to "transformational" entrepreneurs (Schoar, 2010). The implicit assumption in many of these arguments is that great risk tolerance might be positively correlated with either the competence level or ability to generate high returns. While the correlation ex ante could take on any sign, it is important to understand this selection criterion. The effect of making entrepreneurship safer is a priori ambiguous. If entrepreneurs *know* their ability, more insurance leads to more entry of less "able" entrepreneurs (this is the basic force in the model by Lucas (1978)). If entrepreneurs *do not know* their ability, more insurance leads to more entry but no change in composition (Jovanovic, 1982).

The purpose of this paper is to measure whether the reform led to the creation of new firms that have the potential of becoming "big"; or whether instead it just brought in a host of tiny firms that never had the ability to grow. Because its large scale, this reform may have changed visibly the composition of the entrepreneurial pool, along many dimensions such as: Ability (Lucas, 1978), Risk tolerance (Kihlstrom and Laffont, 1979), private benefits of being "one's own boss" (Moskowitz and Vissing-Jørgensen, 2002), optimism (Landier and Thesmar, 2009)

or ambition (Hurst and Pugsley, 2011). In previous work (Hombert et al., 2014), we look at observable measures of entrepreneurial ability and measures of short-term performance. We also investigate the equilibrium implications of the reform, which is large enough to shift the industry equilibrium. Our methodology rests on a difference-in-differences estimation strategy: We compare industries in which the typical new firm that is started is small (the treated group) to industries in which new start-ups are typically larger (the control). The idea is that industries where the natural firms size at start is small are more affected by the reform, since unemployed entrepreneurs tend to start smaller firms.

We show that the PARE reform had a stronger impact in treated than in control sectors. We then look at whether average "quality" of new start-ups was any different between most exposed and less exposed industries, where quality is measured with metrics of firm survival and growth. We find that the propensity of new start-ups to hire or to survive in the first two years did not decline more in treated sectors. New entrepreneurs were not less educated, nor ambitious. So the new firms appeared to have the same quality as the previously created ones. At the industry-level, however, we found that the new jobs created by the reform crowded out job creation among incumbents. But there was a gain in efficiency as the newly created firms are more productive than the incumbents they displaced and also pay higher wages to workers. In this chapter, our goal is to build on the prior analysis to investigate the effect of the reform on the likelihood that the newly created firms will become "big". As opposed to an effect whether the new firms have the same chance of surviving or creating one job. This is unfortunately impossible to do directly in the context of the PARE reform, because our accounting data stop in 2007, giving us too little perspective on the post-creation growth of these firms. To deal with this problem, we start by building a predictor of long-term success on an older cohort of firms –created in 1994– for which we have detailed firm level information (entrepreneur's background, ambition, education etc.). We then check in which direction these success-predicting characteristics changed between before and after the PARE reform. To investigate this, we use the same methodology as in Hombert et al. (2014): We compare industries that are the most exposed to the reform, to industries that are the least exposed.

The paper follows the structure of this two-step methodology. In Section 1, we rapidly survey the existing literature showing that entrepreneurial characteristics predict firm performance. In Section 2, we then focus on the cohort of firms created in 1994, and show which characteristics predict the probability of becoming big. In Section 3, we investigate whether these characteristics changed around the PARE. Section 4 concludes.

1 Entrepreneurial Characteristics and Firm Performance: Literature Review

Our analysis relies on our ability to predict firm performance based on entrepreneurial characteristics. In doing so, this paper relies on a large literature that documents the link between characteristics and firm performance. This Section is a brief review of this literature.

A first important dimension that has been shown to have strong predictive power on a person's propensity to start up a business is wealth of the founder or even shocks to the wealth of the founder, see for example (Evans and Jovanovic (1989), **?**, Holtz-Eakin et al. (1994a), Holtz-Eakin et al. (1994b)). However, in a world where people are credit constraint wealth shocks are also correlated with a relaxation of credit constraints. While the two interpretations similarly predict that wealth correlates with entry rate, they have opposite predictions regarding entrepreneurial success. Under the financing constraint hypothesis, wealthy entrepreneurs are able to invest more and thus to grow faster. In contrast, a pure wealth effect would lead people to start lower quality firms. whereas the luxury good hypothesis predicts that wealthy individuals start lower quality firms. The evidence is mixed. In support of the financing constraints hypothesis, Adelino et al. (2013) and Schmalz et al. (2014) find that positive shocks to real estate prices lead to more entry and higher post-entry growth and Fracassi et al. (2014) show that positive shocks to debt supply have similar effects. In contrast, Hurst and Lusardi (2004) find that wealthy entrepreneurs are more likely to start less capital intensive businesses and Nanda (2008) show that these wealthy entrepreneurs have low quality and are less likely to

be profitable. Similarly, Andersen and Nielsen (2012) show that exogenous wealth shocks lead to the entry of low quality entrepreneurs. This latter set of evidence is consistent with the view that some entrepreneurs start up because they derive nonpecuniary benefits from running a business (Moskowitz and Vissing-Jørgensen, 2002). Consistent with this, Hurst and Pugsley (2011) show that the majority of business owners state they became entrepreneurs for nonpecuniary reasons that and these nonpecuniary motives predict low growth.

A second dimension is the effect of entrepreneurial skills.

Entrepreneurs might be more successful if they have higher education (Van der Sluis et al., 2008) and when they have higher cognitive and social skills (Hartog et al., 2010). Lazear (2005) also argue that entrepreneurs are jacks of all trades rather than specialists. Consistent with this, Hartog et al. (2010) show that entrepreneurs with a balanced portfolio of skills perform better. Another dimension is the role of preferences and beliefs. Theory suggests that risk tolerant (Kihlstrom and Laffont, 1979) and optimistic individuals (De Meza and Southey, 1996) are more likely to become entrepreneurs and, conditional on entry, are of lower average quality. Consistent with this, Hvide and Panos (2014) find that more risk averse individuals are more likely to become entrepreneurs and less likely to survive and Landier and Thesmar (2009) show that optimistic entrepreneurs choose more risky capital structures. On the other hand, access to information can assuage optimism: Lerner and Malmendier (2013) show that individuals exposed to previous entrepreneurs are less likely to start low quality ventures. Finally, a literature investigates the effect of family ownership on firm behavior (Bertrand and Schoar, 2007). In particular, it finds that businesses are more profitable when they are run by their founders (Adams et al., 2009) whereas they are less profitable when they are run by heirs of the founder (Pérez-González, 2006), (Bennedsen et al., 2007) as well as Bertrand et al. (2008). One exception is Sraer and Thesmar (2007) who show that family firms are more profitable because they can honor implicit labor contracts and pay lower wages.

2 Forecasting Long-Term Performance

2.1 Empirical Strategy and Data

2.1.1 Statistical Framework

Our goal in this Section is to lay out a framework how we predict the long-term success of a firm using some of its characteristics at birth. So we simply seek to run a regression of the following form:

$$Y_i = X_i\beta + \epsilon \tag{1}$$

where i indexes the firm. Y_i will be our measure of long-term success, and X_i is the set of characteristics. To ease readability, we present in this paper the results of linear regressions, but have verified that a logistic specification does not give qualitatively different results. The idea is to establish correlations between long term success and certain observable characteristics of the firm and the founder. We are not trying to argue that these characteristics are causally driving the long term outcome at the exclusion of other variables. But we believe that they might be an indicator some underlying fundamental difference of successful start-ups.

We focus on the cohort of French firms started in 1994, for which we have long-term performance data (until 2007) and for which we can obtain founder characteristics using a separate survey.

2.1.2 Firm Characteristics

To measures the characteristics, X_i, we rely on a large-scale survey run by INSEE, the French statistical office, every 4 years starting in 1994 (see Landier and Thesmar (2009) for an extensive description of this survey). This survey samples approximately one third of all new firms registered in the country during the first semester of a given year. To achieve maximum representativeness, it uses stratified sampling, where the strata are the headquarter's region and the 2-digit industry of the firm. The SINE survey has been run in 1994, 1998, 2002, 2006 and 2010. Each time, the coverage is high because filling in the questionnaire is compulsory: The response

rate is typically around 85%. This survey contains firm-level identifying number, which allow it to be matched with accounting data (see below).

In the 1994 wave of the SINE survey, we have 26,674 different new firms. As predictors of long-term success, we use variables that relate both to characteristics of the project and of the entrepreneur. These variables are selected because they have been shown in other studies to be predictors of the upside potential of a new venture.

- **New idea** This variable is a dummy equal to 1 if the motivation of the entrepreneur was to "implement a new idea", as opposed to "seizing an opportunity", "not being able to find a job", or "be autonomous". Landier and Thesmar (2009) have shown that this variable correlates very strongly with measures of entrepreneurial optimism, as finding consistent with the behavioral literature.

- **Local market** This variable is equal to 1 if, at the moment of the survey, the entrepreneur declares that his clientele is "local", as opposed to a "international", "cross-border", "national", or "regional". In contrast to "new idea", we expect firms addressing a local clientele to have, a priori, less upside potential.

- **Subsidized** This variable is equal to 1 is the entrepreneur declares that he receives at least one subsidy. During the 1990s, a popular state-funded subsidy was given under the ACCRE program, which gives a lump-sum to unemployed entrepreneurs. But regions and municipalities also subsidize entrepreneurship through cash transfers or in-kind support. These subsidies are typically small, and should not make a difference for a truly ambitious entrepreneur, unless he really is credit constrained.

- **Ambition** We use two separate questions: One about hiring plans and one about growth expectations. Both of these questions are intended to measure the entrepreneur's ambition to grow, i.e. his belief in the upside potential of the firm. The first question specifically asks to the entrepreneur, during the year when the firm was founded (here, in 1994) whether the entrepreneur plans to hire one or more employees in the coming year. The entrepreneur

can reply: Yes, No or Don't know. We set the "hiring plans" dummy to 1 if the entrepreneur answers Yes. The second question is formulated the following way: "What do you think will happen to your start-up over the next 6 months? (a) it will grow (b) it will keep steady (c) I will have to turn around a difficult situation (d) I will shut down the firm (e) Don't know". We code the "growth plans" dummy to 1 if the answer is (a).

- **Serial entrepreneur** This dummy is equal to 1 if the entrepreneur declares that the present start-up is not his first.
- **Former manager** This dummy is equal to 1 if the entrepreneur is a former executive. It is intended to measure both entrepreneurial ability and outside options on the salaried labor market. The question allows the surveyed entrepreneur to select within broad categories of the French job classification: "independent" (shopkeepers, lawyers), entrepreneur, executive, supervisor / middle manager, white and blue collar worker, student or inactive.
- **College education** This dummy is equal to 1 if the entrepreneur declares to have college degree. It is related to the "former manager" dummy in that it measures both outside options and potentially entrepreneurial ability. The options in this question are: no high-school degree, high-school degree below high-school graduation, high-school graduate, short college degree (2 years), college graduate, engineering degree. We take all college degrees (short, long, engineering) into our dummy.

We report summary statistics for these variables in Table 1. For comparison, we tried as much as possible to reconstruct the same variables for other waves of the SINE survey (1998, 2002, 2006). It was not always possible to do it exactly as the phrasing of some questions changed somewhat.

We report these numbers to discuss robustness only: Our subsequent analysis in 1994, about half of the entrepreneurs were selling to local clients, 30% to one form or another of subsidy. About our "ambition measure": about 40% of the entrepreneur expect further growth, and 20% plan on hiring at least an additional person. About 20% of entrepreneurs are former executives, and about 30% have a college degree (short or long). This makes the average entrepreneur significantly

more skilled than the average person in the labor force. For instance, Schmalz et al. (2014) report that in the general population aged 20-65 in France, on average over 1990-2002, approximately 16% have a college degree (see their Table 3).We make one more change to ease readability. In our regressions, we invert the sign of the two variables "local markets" and "subsidised" so that all characteristics in our list are expected to have a positive impact on long-term growth.

2.1.3 Accounting Data

Accounting data come from tax files, made available by INSEE to researchers (see Bertrand et al. (2007) for a more detailed description). Besides detail accounting information, tax files also provide us with the number of employees. They cover all firms subject to the regular corporate tax regime (*Bénéfice Réel Normal*) or to the simplified corporate tax regime (*Régime Simplifié d'Imposition*), which together represent 55% of newly created firms during our sample period. Small firms with annual sales below €32,600 (€81,500 in retail and wholesale trade) can opt-out and choose a special micro-business tax regime (*Micro-Enterprise*), in which case they do not appear in the tax files. Since expenses, and in particular, wages cannot be deducted from taxable profits under the micro-business tax regime, firms opting for this regime are likely to have zero employees. For this reason, in the empirical analysis we will assume that firms that do not appear in the tax files do not have employees.

Besides accounting and employment information, tax files include the same firm identifying number as the SINE survey. We thus use it to merge the two datasets. We show in Figure 2 the product of this operation. For each date t, we plot in this Figure the number of firms present in the 1994 SINE survey that are also found in the tax files at date t. Figure 2 shows that the matching procedure is quite efficient, as about 18,000 firms –out of some 31,000– from the SINE survey report accounts to the tax authorities in 1995 – the number is slightly smaller in 1994 because firms are not mandated to report accounts after their first year of activity. The firms not present in the tax files have either exited, or do not generate enough annual turnover to make it into the regular corporate tax regime. The other lesson

of Figure 2 is that there is significant attrition, as expected in the demographics of young firms: Starting from 18,000 in 1995, the number of firms still alive shrinks to some 12,000 in 2000, which corresponds to a five-year attrition rate of some 33%.We use the tax files to compute several measures of "long-run success" of the firm Y_i. Our main measure is a dummy equal to one if the firm has more than 50 employees in 2007 (after 12 years). We set this dummy equal to missing if the firm exits the sample before its twelfth anniversary, so our main measure of long-term success jointly measures growth *conditional* on survival. In Figure 3, we plot the fraction of surviving firms from the 1994 SINE survey that have reached at least 50 employee. This number doubles between 1994 and 2007, from less than 0.4% to about 1% at the end of the period. This both reflects the fact that surviving firms grow, and cross the 50 employee threshold and that the total number of firms decreases over time, as shown in Figure 2. Note that 1% of firms surviving up to 2007 corresponds to about 90 firms. While the number of "large" firms is not very big, it is not surprising that these firms account for a large share of all jobs. In Figure 4, we illustrate this skewness effect by reporting, for each year t after 1994, the fraction of the cohort's total employment that comes from members of this cohort that employ more than 50 workers. This number goes up over time, as expected given the rising fraction of large firms shown in the previous figure, and it is in the vicinity of 20% towards the end of the period. Hence, the job-creation potential of cohort of firms, after a few years, is greatly affected by the contribution of the best performers.We have experimented with alternative measures of long term growth, such as for instance a dummy equal to one if the firm grows its workforce by at least 600% in the first 10 years, and zero else (including if the firm exits). Another alternative measure was simple the log of one plus the number of employees 10 years after creation, and zero if the firm exits before. These alternative measures give similar results, which we choose not to report to save space. Finally, to analyze risk-taking, we create a dummy variable equal to one is a firm of our cohort present in tax files at date t is not in the tax files at $t+1$. Thus, we study the propensity to exit on the panel of all firms in the 1994 SINE survey, tracked over 1994-2007. Our contention is that characteristics that predict long-term growth are characteristics that also predict failure, since we expect transformational entrepreneurs to both "aim bigger" and

take more risk.

2.2 Results

We regress various specifications of equation (1) and report the results in Table 2. Significant or not, we find that all variables predict long-term success in the expected direction. When we focus on statistically significant variables, we find that the main predictors of long-term success are not the obvious measures of intrinsic ability (such as education or past working experience) but variables related to the "seriousness" of the project: Ambition, serial entrepreneurs, and new idea motivation. We estimate linear probability models, so the coefficients receive direct interpretations. We find pretty large effects. For instance, entrepreneurs motivated by "new ideas" are 1 percentage point more likely to become large. This is a large effect, given that the probability of being large conditional on survival up until 2007 is equal to 1% (see Figure 3), so the fact that the "new idea" motivation double the probability of success. Another very strong predictor of success is our ambition measure, in particular the fact that the entrepreneur declares hiring plans a few months after creation. Given the rigidity of French labor laws, hiring is a major decision for a small firm, and it not entirely surprising that it has predictive power over long-term growth. When the entrepreneur "plans to grow" in the year of creation, the probability of eventual success increase by about 50 bp, which corresponds to an increase by 50%. Last, a serial entrepreneur is approximately 1pp more likely to succeed conditionally on survival, which again corresponds to a doubling of the average probability.We then find evidence weakly consistent with the idea that entrepreneurs that are more likely to achieve long-term success are also the ones that take more risk. To show this, we regress the exit dummy on entrepreneurial characteristics, and report the result of this investigation in Table 3. Again we estimate a very simple OLS regression to ease readability. Some of the variables that predict long-term success also correlate with exit probability. For instance, a serial entrepreneur is 1pp more likely, every year, to exit from the tax files –to be compared to an average exit rate of about 8% per year. A new idea driven entrepreneur is about 60bp more likely to exit every year. An entrepreneur still

forecasting business growth a few months after creation is about 40bp more likely to exit every year. Some other variables that do not strongly predict long-term success also predict failure: College graduates are more likely to fail (1.1 percentage points). Non-subsidized businesses are also more likely to fail.

3 Did the PARE Reform Alter the Fraction of High-potential Start-ups?

Our goal in this Section is to look at whether characteristics that predict long-term success change around the 2002 PARE reform, which drew many unemployed individuals into the entrepreneurship pool. First we describe the empirical methodology and the data. Then we discuss our results.

3.1 Methodology and Data

3.1.1 Methology

In this Section, we follow the methodology developed in Hombert et al. (2014). We look at the evolution of entrepreneurial characteristics in industries that are the most exposed to the PARE reform, *compared* to the evolution in the sectors that were the least exposed to the reform. In mathematical terms, this amounts to running the following regression:

$$X_{ist} = a_s + \sum_{k=1}^{4} b_k POST_t \times T_{s,k} + \sum_{k=1}^{4} POST_t \times Z_s + \epsilon_{ist} \tag{2}$$

where X_{ist} is a start-up/entrepreneur characteristic. X_{ist} corresponds to the predictors of long-term success that we have identified in the previous Section – such as new idea, serial entrepreneurs or initial ambition. We also look at the "predicted probability of long-term success" estimated in equation (1) as the linear combination of all entrepreneurial/firm characteristics that optimally predicts long term success.$T_{s,k}$ is a treatment variable, which is equal to 1 if the firm is in the the k^{th} quartile of exposure to the PARE reform. We will measure exposure to PARE

as a "small scale" industry, i.e. an industry where it is easy to start small (see below). Thus, if the reform has a clean, identifiable effect on the entrepreneurial composition, the coefficient b_k should be monotonically increasing or decreasing in k. Finally, Z_i stands for a set of observable controls, which may explain changes in the composition of entrepreneurs independently of the reform.

3.1.2 Measuring Treatment

To construct the sector-level treatment variable $T_{s,k}$, we follow Hombert et al. (2014) and compute the fraction of firms created as sole proprietorships in each industry. To do this, we exploit the French registry of firm. The registry contains the universe of firms that are registered each month in France. This is a monthly data set. It is available from 1993 to 2008. For each newly created firm, it includes the number of employees at creation, the industry the firm operates in, using a 4-digit classification system similar to the 4-digit NAICS. It also provides the firm's legal status (Sole Proprietorship, Limited Liability Corporation, or Corporation). For each 4-digit sector, we compute the fraction of sole proprietorships among newly created firms over 1999-2001, and then sort industries into quartiles of the treatment intensity. This leads to the four treatment variables $T_{s,k}$ for $k \in \{1, 2, 3, 4\}$. In Hombert et al. (2014), we show that sectors in the high treatment group are the ones one would expect: business consultants, contractors, hairdressers, taxi drivers etc.

3.1.3 Characteristics

The industry controls Z_s are computed using the tax files described previously. We use two variables which are defined in the pre-reform period. $(K/L)_s$ is the average fixed asset to employment ratio of all firms in sector s over the period 1999-2001. Sales gr_s is the average annual sales growth of all firms over the same period. These two industry variables are designed to pick up any change in characteristics that are due to differential industry exposure to the business cycle. They turn out to be statistically insignificant.The characteristics X_{ist} on the LHS of equation (2) are obtained from the SINE survey described in Section 2.1.2. We use two waves of the survey: 2002 (before the PARE reform) and 2006 (after the PARE

reform), so we only have two observations per industry s. We report averages of the characteristics in the two periods in Table 1: Some variables receive the exact same definitions as in Section 2.1.2. These are cases where the phrasing of the question is identical (local clients, ambition variables, serial entrepreneur, former executive and college graduates). Two variables exhibit significant breaks however (new idea and subsidy) because the alternatives provided in the questions differ a bit. This means that it is difficult to interpret the aggregate change in characteristics directly, but our difference-in-difference framework will help somewhat. The assumption here is that the change in variable coding between 2002 and 2006 is orthogonal to whether an industry is "small scale" or not.Finally, we construct the expected probability of success of a venture using the coefficients on characteristics estimated in the previous Section for the 1994 cohort. We use a dummy equal to 1 if the firm reaches at least 50 employees 12 years after creation, and the coefficients estimated in column (9) of Table 2. The underlying assumptions here are that (1) the relationship between characteristics X and long-term success probability is stable over time, including for the 2002 and 2006 cohort and (2) that the noise introduced by the changes in the exact definitions of characteristics is uncorrelated with our treatment variables. Using this technique to estimate, at the start-up level the predicted probability of success, we find that the average (median) is equal to 1% (0.5%) in 2002 and 1.3% (0.5%) in 2006. It thus remains to be seen whether such an estimated probability increases more in exposed industries, which is the goal of the next Section.

3.2 Empirical Results

We estimate equation (2) and report the results in Table 4. We find that, if anything, the share of entrepreneurs that success-predicting characteristics in the long-run increases more in exposed industries. The fraction of entrepreneurs motivated by the implementation of a new idea increases by 11 pp more in exposed industry than in less exposed ones. This difference is significant at 1% and large given that the fraction of such entrepreneurs in the 2002 sample is only 20%. A similarly big effect can be found for the frequency of serial entrepreneurs, which increases by 7pp more in exposed sectors (while the sample frequency in 2002 is 13%). Finally, the fraction

of ambitious entrepreneurs also grows significantly more in treated sectors, but the effect is smaller economically: the fraction of entrepreneurs who expect to grow increases by 2.5pp, only one tenth of the sample frequency in 2002 (24%). One variable, however, goes in the opposite direction: The fraction of former executives, which drops by 14pp, almost half of the sample mean of 30% in 2002. We then aggregate all of these variables into a single predicted success probability, and check in column (9) how this predicted success is affected by the reform. We do not find much statistical action here. The decrease in the fraction of former executives among entrepreneurs fully compensates the increase in the fraction of entrepreneurs endowed with new ideas, serial entrepreneurs and ambitious ones, so that the impact on the average probability is marginally negative. To further highlight the role of the "former executive" dummy, we use in column (10) a predicted probability computed using all the coefficients from column (9), Table 2, *except* the coefficient on "former executive", which we set to zero. If we remove this effect, the proportion of potential successful start-ups actually *rises* by 0.6pp (for a sample mean of 1%) in the most exposed industries. All in all, given that the "former executive" is not a very precisely estimated predictor of long-term success (it is statistically significant at 10% only in Table 2), we conservatively conclude that the PARE reform has little effect on the long-term potential of new ventures.

4 Conclusion

The French Reform of 2003, documented in Hombert et al. (2014), led to massive increase in supply of entrepreneurs. The question we investigate in this article is whether it led to a significant reduction in the potential for long-term success of new ventures, since the reform might have drawn in people with different competence levels or ambitions to grow their firms. We proceed in two steps. First, we show that some entrepreneurial and project characteristics, which we can measure using a large-scale survey, significantly predict the probability that newly founded firms succeed in the long-run. We show that firms started by entrepreneurs who plan on growing, have already had entrepreneurial experience, are motivated by new ideas, are significantly more likely to employ at least 50 persons after 12 years. We then

use this relationship to see if the success potential of start-ups was significantly deteriorated by the 2003 reform. We find that it was not. A caveat of our analysis is that we observe very few very successful firms, and that we have to content ourselves with the 50 employees threshold as a measure of success. A possible route for improvement in our methodology would be to estimate Pareto coefficients for the tail of the distribution of long-term firm size.

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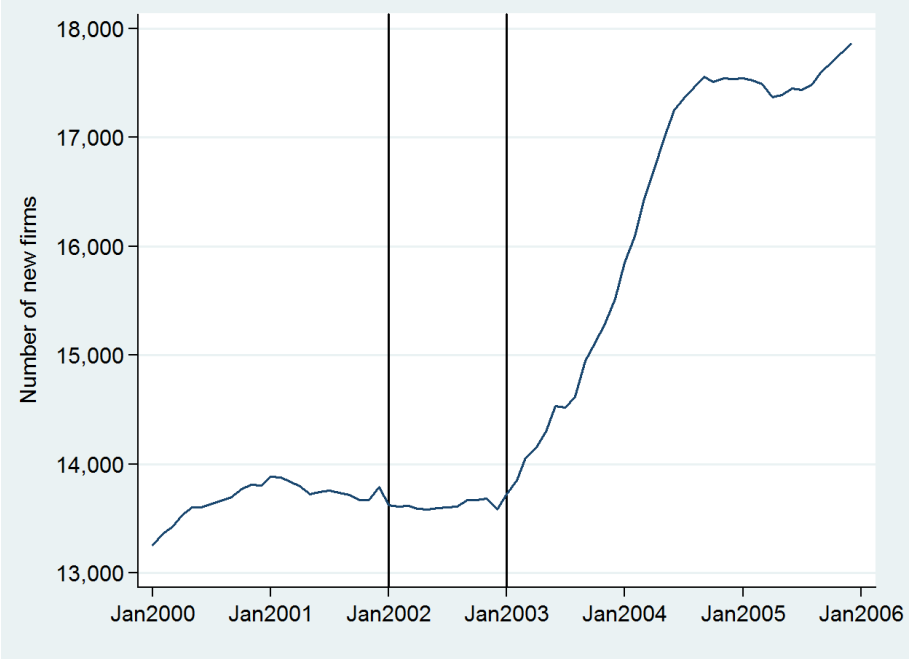
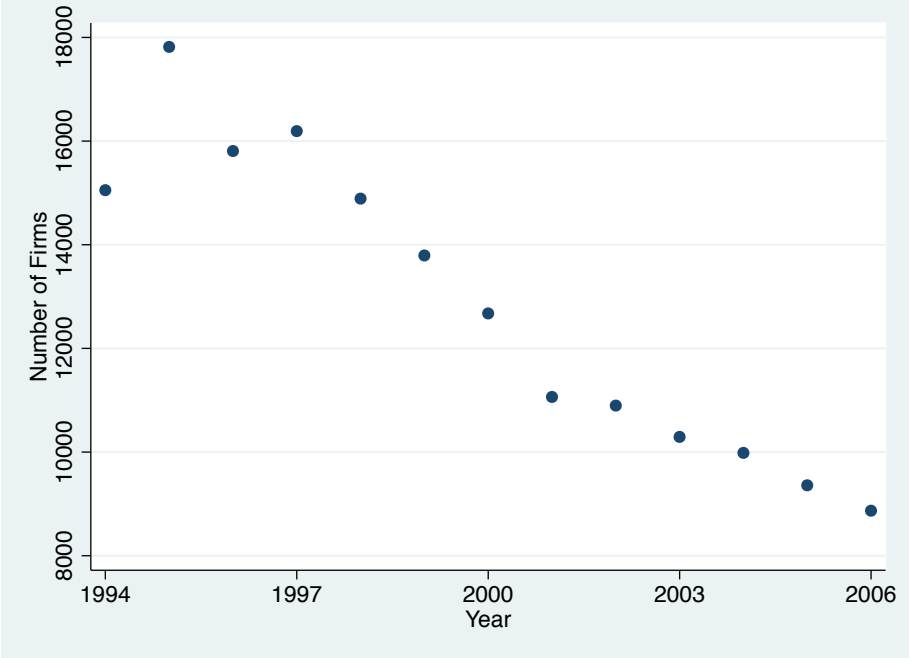
A Figures

Figure 1: Number of New Firms Created in France



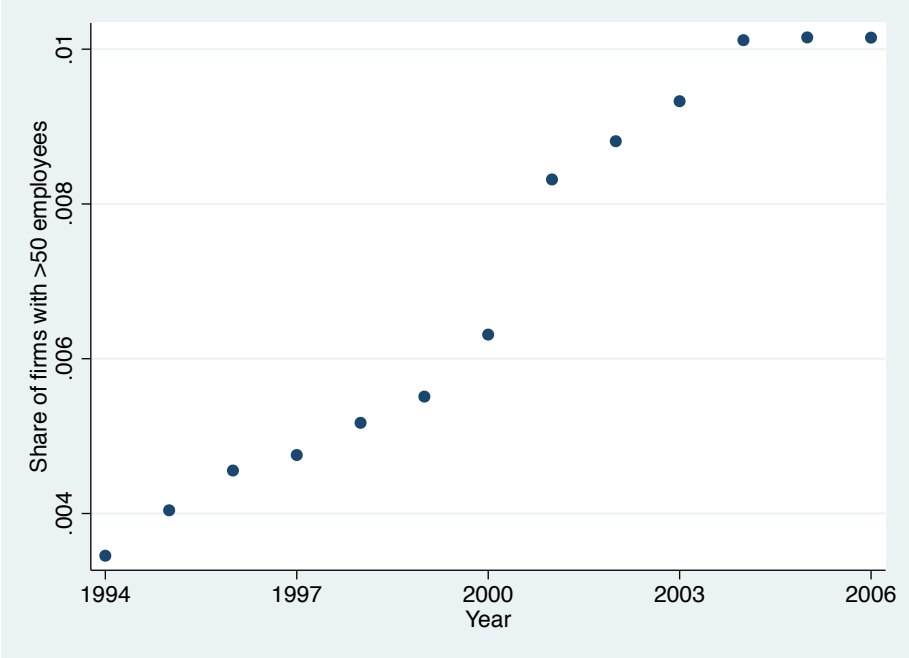
Source: Hombert et al. (2014)

Figure 2: Attrition in the 1994 Cohort of Firms Present in both SINE and the Tax Files



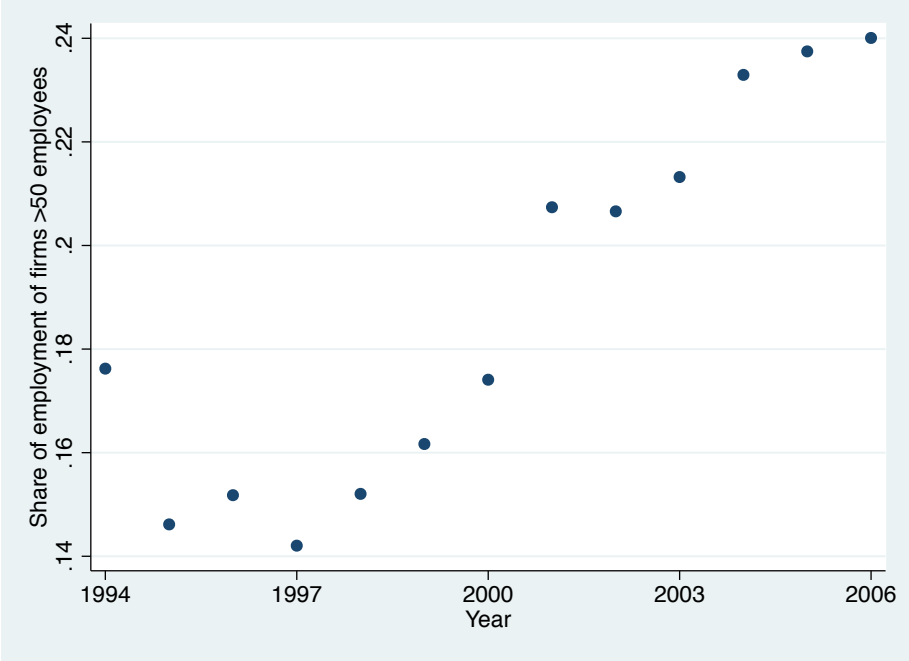
Note: To draw this Figure, we start with the initial sample all firms present in the SINE survey in 1994. For each year t, we then plot the number of firms from this sample that are in the present in the tax files. For instance, about 18,000 firms from the 1994 SINE survey are found in the tax files

Figure 3: Fraction of Firms Created in 1994 with More Than 50 Employees



Note: To draw this Figure, we start with the initial sample all firms present in both the tax files and the SINE survey in 1994. In year t, we compute the fraction of firms in the initial sample that are still in tax files at date t and have more than 50 employees.

Figure 4: Fraction of Employment of the 1994 Cohort that is Accounted for by "Large" Firms



Note: Each date t, we compute the total employment of firms present in the 1994 SINE survey and still present in the tax files. Out of this total employment, we calculte the share of employment that comes from firms born in 1994, present in the SINE survey, and still present in the tax files. For example, in 2001, about 21% of the employment of the 1994 cohort was accounted for by firms hiring at least 50 employees.

B Tables

Table 1: The Characteristics of French Entrepreneurs

	Wave of the SINE survey			
	1994	1998	2002	2006
% Motivation: Implementing a new idea	.083	.14	.2	.028
% Most clients local	.5	.55	.55	.58
% Took subsidy	.31	.27	.28	.43
% Plans to grow	.43	.48	.47	.55
% Plans to hire	.21	.24	.24	.24
% Serial entrepreneur	.064	.12	.13	.12
% Former executive	.18	.15	.22	.27
% College diploma	.36	.33	.3	.33
Average number of observations	30778	30067	47668	48597

Note: These number are obtained using four different waves of the SINE survey (firms created in 1994, 1998, 2002 and 2006). The bottom line is the average number of observations across variables (some variables are not defined on the entire sample due to missing values). Definitions for 1994 are described in the main text. Questions change slightly from year to year; We tried to harmonize the variable definition across cohorts as much as possible.

Table 2: Predicting the Probability of Exiting the Data in the Following Year

	=1 if > 50 empl. in 2007								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
% new idea driven	.01***								.008***
	(.0029)								(.003)
% non subsidized		.0016							.00094
		(.0022)							(.0017)
% selling globally			.0073***						.0018
			(.0022)						(.0017)
% serial entrepreneurs				.0097***					.0072**
				(.0033)					(.0034)
% managers					.0066***				.0041*
					(.002)				(.0021)
% college grads						.0013			.00033
						(.0019)			(.0019)
% growth plans							.01***		.0028
							(.0021)		(.0017)
% hiring plans								.016***	.0056***
								(.0025)	(.0021)
Observations	7,672	8,583	8,583	7,716	7,672	7,672	8,520	8,520	7,610
R-squared	.017	.026	.027	.016	.017	.016	.029	.031	.021
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: OLS regression results with 2-digit industry fixed effects. In all regressions, the LHS variable is a dummy equal to 1 if the firm created in 1994 (1) is still present and (2) has more than 50 employees in 2007. Columns (1)-(8) only include one potential project-entrepreneur characteristic, while column (9) includes them all together. *** means "significant at 1%".

Table 3: Predicting the Long-Term Success Probability

	=1 if firm at t disappears from data in $t+1$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
% new idea driven	.0049*								.0036
	(.0027)								(.0027)
% non subsidized		-.0044***							-.0047***
		(.0015)							(.0016)
% selling globally			.004***						.0046***
			(.0014)						(.0015)
% serial entrepreneurs				.0088***					.012***
				(.0029)					(.003)
% managers					-.0058***				-.0087***
					(.0019)				(.0019)
% college grads						.0078***			.0083***
						(.0017)			(.0017)
% growth plans							.0024*		.0025
							(.0014)		(.0016)
% hiring plans								.002	.0019
								(.0017)	(.0019)
Observations	144,526	161,038	161,038	145,391	144,526	144,526	160,076	160,076	143,604
R-squared	.0096	.0095	.0095	.0097	.0096	.0097	.0091	.0091	.0097
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: OLS regression results with 2-digit industry and year FE. We focus in these regression on firms present in the 1994 wave of the SINE survey, and use all observations from 1994 to 2007. In all regressions, the LHS variable is a dummy equal to 1 if the firm present in year t exits from tax files $t+1$. Columns (1)-(8) only include one potential project-entrepreneur characteristic, while column (9) includes them all together. *** means "significant at 1%".

Table 4: Predicting the Long-Term Success Probability

	Entrepreneur / Project Characteristics									
	New idea	Non Subsidized	Global Market	Serial Entrepreneur	Former Manager	College Graduate	Wants to Grow?	Wants to Hire?	Predicted success I	Predicted success II
POST	-.26***	-.15***	-.0097	-.07***	.29***	.0095	.059**	-.03	.0041**	-.0075***
	(-6.5)	(-6)	(-.32)	(-4.2)	(3.5)	(.28)	(2.3)	(-1.6)	(2.5)	(-5.3)
POST × Q2	-.008	-.028	-.0089	.032***	.0081	-.012	.011	-.016	-.00069	.0021**
	(-.27)	(-1.5)	(-.42)	(2.7)	(.16)	(-.63)	(.6)	(-1)	(-.55)	(2.1)
POST × Q3	.042	-.019	-.0048	.052***	-.013	.002	.01	.0066	-.00067	.0042***
	(1.4)	(-1.2)	(-.29)	(4.8)	(-.22)	(.11)	(.75)	(.58)	(-.55)	(4.6)
POST × Q4	.11***	-.0023	.0091	.071***	-.14***	.0044	.045***	.025**	-.002*	.0063***
	(4.1)	(-.14)	(.61)	(6.5)	(-2.9)	(.25)	(3.3)	(2.2)	(-1.7)	(7.1)
POST × K/L	.014	.01	-.0068	.0037	-.077**	.01	-.0043	.0088	.00036	.00048
	(1.3)	(1.3)	(-.72)	(.75)	(-2.3)	(.82)	(-.52)	(1.5)	(.8)	(1.1)
POST × Sales gr	-.027*	-.029**	-.02	-.0055	.063	.008	.003	-.014*	-.00072	-.00079
	(-1.7)	(-2.4)	(-1.6)	(-.74)	(1.1)	(.5)	(.25)	(-1.8)	(-1.1)	(-1.3)
Observations	89670	87816	87498	87993	70364	88026	89670	87526	69967	87247
R^2	.11	.067	.17	.025	.11	.25	.034	.057	.032	.035

Note: In this Table, we estimate equation (2) using the 2002 and 2006 waves of the SINE survey. $POST = 1$ in 2006, and 0 in 2002. Q2-Q4 are quartile of intensity of exposure to the PARE reform; Q4 is equal to 1 for sectors in the top quartile of the fraction of firms started as sole proprietorships. Columns (1)-(8) use as LHS each of the characteristics investigates in Tables 2 and 3. Column (9) uses as LHS the predicted probability of having at least 50 employees 12 years after creation, using the coefficients in column (9), Table 2. In column (10), we use an alternative measure of predicted probability, that uses all the coefficients of column (9), Table 2, *except* the "former executive" coefficient, that we set to zero. *** means "significant at 1%".