# New Business Formation and Superstar Firms: New Evidence From France

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**Abstract**

This paper documents novel stylized facts linking the decline in business formation to the rise of superstar firms using comprehensive French administrative data. Industries with larger increases in superstar firms' market share experience more pronounced decreases in new business creation. Rising concentration discourages low-ability, but not high-ability, entrepreneurs from starting businesses. This results in higher average firm quality as measured by a higher fraction of highly-educated, former executives, and serial entrepreneurs. Our findings help reconcile seemingly contradictory evidence in the literature and align with theories emphasizing technological changes that benefit the most productive firms while raising entry barriers.

# 1 Introduction

The pace of new business formation in developed economies has been on a downward trend since the 1980s.[1] This decline has raised concerns about diminishing economic dynamism and its potential impact on job creation and innovation. At the same time, the rise of dominant "superstar" firms has increased market concentration in various industries. This paper links these two trends: we show that industries with rising concentration have falling rates of new firm formation. The new firms that are created in high-concentration industries are also higher quality, as measured by *ex-ante* characteristics and *ex-post* survival rates. Our findings imply that concentration raises barriers only high-ability entrepreneurs can overcome, discouraging low-ability entrepreneurs from entering the market.

The rise in concentration could reflect either higher entry barriers that create market power, or an increase in the productivity of the most productive firms (Syverson, 2019). We present a stylized model that parsimoniously encapsulates both views of changing competition. Under the market power view, higher concentration reflects a decline in competition, consistent with empirical estimates of rising markups (e.g. Gutiérrez and Philippon, 2017; Hall, 2018; De Loecker, Eeckhout, and Unger, 2020). Under the productivity view, concentration results from increased competition due to technologies that favor large incumbents (Bessen, 2020; Autor et al., 2020; Lashkari, Bauer, and Boussard, 2024). Both views predict that there are fewer new entrants in industries with rising concentration, but they have different implications for the characteristics of the new entrants. High markups allow more low-ability entrants to cover fixed costs, leading to more but lower-quality entrants. In contrast, productivity advantages create barriers only high-ability entrepreneurs can overcome, implying fewer but higher-quality entrants.

A series of stylized facts about French industries motivates our cross-industry analysis. First, we show that aggregate new firm entry has declined, as reflected by both the entry rate and the share of output accounted for by new firms. Second, we document a rise in average market concentration across industries. Finally, we find that the average quality of entrants has increased over time, as indicated by educational attainment and professional experience. We then move to the cross-section of industries to directly relate concentration to the pace of new firm entry.

Our first contribution is to show that higher concentration is correlated to lower new entry rates,

[1]The decline in entrepreneurship has been documented both for the United States (e.g., Decker et al., 2014; Gourio et al., 2014; Hathaway and Litan, 2014a,b; Decker et al., 2016a,b; Akcigit and Ates, 2021), and internationally (e.g., Criscuolo, Gal, and Menon, 2014; Bijnens and Konings, 2020). For discussions of the general decline in economic dynamism, see, e.g., Decker et al. (2014, 2016a,b); Pugsley and Hurst (2011); Akcigit and Ates (2021).

as theory predicts. Following Autor et al. (2020)'s methodology with French administrative data, we use several measures of concentration and new entry activity at the 3-digit industry level. We show a robust pattern that increases in superstar firms' market share see more pronounced decreases in new business creation. A one p.p increase in the share of the largest 20 firms implies a 2.7% decrease in the long-term rate of new firm creation. This relationship holds across various measures of concentration and remains robust to extensive controls for industry characteristics. To our knowledge, this evidence provides the first direct link between rising concentration and declining business formation. The link between concentration and entry is not just because industries with fewer entrants are mechanically more concentrated: Rising concentration also stems from the exit of less productive and smaller incumbents.[2]

Our second contribution is to show that changes in concentration are associated with changes in firm quality across industries. We study quality using both *ex-post* measures of firm success, and *ex-ante* measures of entrepreneur characteristics that are available in French administrative data. Our evidence is consistent with the productivity-based theory of superstars. A one p.p increase in the market share of the largest 20 firms corresponds to a 26 p.p increase in entrepreneurs with executive experience, an 11 p.p decrease in those from blue-collar backgrounds, and a 37 p.p increase in the share of innovative entrepreneurs. While concentration discourages low-ability entrepreneurs from entry, it does not discourage high-ability entrepreneurs: our *ex-ante* measures of new firm quality predict future performance, and concentrated industries have a higher share of *ex-post* high-growth startups among new entrants along with more exits of lower-productivity and smaller incumbents.

These findings contradict the view that new business formation decreases due to increased market power, which would imply that more businesses are created in industries where market power increases (Albrecht and Decker, 2024). However, superstar firms might still exercise firm-specific market power, for instance through regulations or practices that disproportionately affect low-ability potential competitors. Our model shows that in this case, superstar firms would reduce employment to maintain high prices and would not share rents through higher wages. Instead, we find that superstar firms' employment increases and they offer higher wages in industries with rising concentration. These employment and wage patterns rule out a selective market power story and further support the productivity-based explanation.

[2]Measuring concentration using only pre-existing firms yields similar, though somewhat smaller, effects, further showing our findings are not mechanically driven by entry patterns.

Our findings help reconcile divergent conclusions researchers have drawn about the state of entrepreneurship in the United States. Studies documenting a decrease in the quantity of new businesses (e.g., Decker et al., 2014; Gourio et al., 2014; Decker et al., 2016a; Bijnens and Konings, 2020; Karahan, Pugsley, and Şahin, 2024) or the contribution of young firms to aggregate employment (e.g., Decker et al., 2014, 2016b; Furman and Orszag, 2018; Sterk, Sedláček, and Pugsley, 2021) suggest a decline in business dynamism. Conversely, research documenting an increase in the average quality of new businesses (Fazio et al., 2016; Guzman and Stern, 2020) reach a more optimistic conclusion. Our evidence from France shows these trends can coexist: young firms' growth rates exhibit *decreasing* skewness in employment but *increasing* skewness in sales. That is, while the distribution of employment growth has become less right–skewed (fewer extreme employment gains), the distribution of sales growth has become more right–skewed, indicating that the highest–quality firms are achieving very high sales despite employing fewer workers. This finding suggests that high-quality new firms have not vanished but have instead shifted towards less labor-intensive business models, reducing their contribution to job creation. This interpretation aligns with Barkai and Panageas (2021), who show that young public firms' share of U.S. aggregate output remained stable during our sample period.

We contribute to the literature on the causes of declining new business formation. Recent studies have proposed various explanations, including the slowdown in population growth (Bornstein, 2018; Engbom et al., 2019; Hopenhayn, Neira, and Singhania, 2022; Karahan, Pugsley, and Şahin, 2024) and skill-biased technical change (Salgado, 2020; Kozeniauskas, 2018; Jiang and Sohail, 2023). While these factors are compatible with our proposed explanation, they do not fully account for our findings. First, we show that our main findings persist even after controlling for the *ex-ante* age distribution of entrepreneurs, addressing potential demographic confounds. Second, we find no significant relationship between entrepreneurs' *ex-ante* education levels and changes in business formation across industries, mitigating concerns about skill-biased explanations. Our results also remain robust when controlling for a broader set of variables measuring the *ex-ante* skill composition of entrepreneurs in each industry. These results suggest that the rise of superstar firms explains the decline in new business formation beyond existing theories. Overall, our evidence indicates that explanations unable to account for the disappearance of low-ability entrepreneurs cannot fully explain the observed decline in new business formation.

Our paper also relates to the literature on the increase in market concentration and the rise of superstar firms. This literature has studied the implications of the rise of superstar firms for

the labor share (Autor et al., 2020), the average markup of price over marginal cost (Decker et al., 2020), and competition (Philippon, 2019; Baker, 2019). Our findings complement recent evidence from the U.S. documented by Albrecht and Decker (2024), who find no compelling evidence that rising market power is associated with declining dynamism. We show suggestive evidence that the productivity of superstar firms has increased with concentration, which suggests that the decline in business formation is a sign of economic dynamism – not sclerosis. This interpretation aligns with Saia, Andrews, and Albrizio (2015), who show that productivity growth at the frontier has remained robust despite the aggregate productivity slowdown, and Lashkari, Bauer, and Boussard (2024), who show that falling IT prices explain around half of the changes in concentration in France. This timing is also consistent with recent papers that link the rise of superstar firms to improvements in technology (Hsieh and Rossi-Hansberg, 2023; De Loecker, Eeckhout, and Mongey, 2021), in particular IT (Autor et al., 2020; Bessen, 2020; Kwon, Ma, and Zimmermann, 2024), and international evidence that the decline in business formation is driven by the most IT-intensive industries (Bijnens and Konings, 2020).

## 2 A Framework for Superstar Firms

This section presents a simplified framework based on Melitz (2003), in which a subset of firms become "superstars" and capture a large share of industry revenue. We consider two alternative explanations for superstar dominance: *market power* versus *productivity*. We then explore how each theory affects both the *quantity* and *quality* of new entrants.

### 2.1 Setup

**Preferences and Demand.** Consumers have constant elasticity of substitution (CES) preferences over a continuum of varieties $\omega$:

$$U = \left[\int_{\omega\in\Omega} q(\omega)^{\frac{\sigma-1}{\sigma}}\, d\omega\right]^{\frac{\sigma}{\sigma-1}}, \tag{1}$$

where $\sigma > 1$ is the elasticity of substitution. From (1), consumer demand and producer revenue for each variety $\omega$ are:

$$q(\omega) = \left(\frac{p(\omega)}{P}\right)^{-\sigma} \frac{R}{P}, \tag{2}$$

$$r(\omega) = \left(\frac{p(\omega)}{P}\right)^{1-\sigma} R, \tag{3}$$

where $R$ is total nominal income, and $P$ is the CES price index:

$$P \;=\; \left[\int_{\omega\in\Omega} p(\omega)^{1-\sigma}\, d\omega\right]^{\frac{1}{1-\sigma}}. \tag{4}$$

**Profits and Entry.** We consider a large pool of potential entrants. Each firm pays a sunk fixed cost $f$ to enter and then draws productivity $\varphi$ from a distribution $G(\varphi)$. Surviving firms also pay a per-period fixed cost $f$ and face constant marginal cost $1/\varphi$. Each firm exits the market with exogenous probability $\delta \in (0,1)$ in each period.

Assume $G(\varphi)$ follows a Pareto distribution with shape parameter $\theta$:

$$G(\varphi) \;=\; 1 - \left(\frac{\underline{\varphi}}{\varphi}\right)^{\theta} \quad \text{for } \varphi \geq \underline{\varphi}, \quad g(\varphi) \;=\; \theta\, \underline{\varphi}^{\theta}\, \varphi^{-\theta-1}.$$

We require $\theta > \sigma + 1$ to ensure integrability. Under CES utility, a firm with productivity $\varphi$ has revenue and profit:

$$r(\varphi) = \left(\frac{p(\varphi)}{P}\right)^{1-\sigma} R \;=\; \left(\frac{\sigma-1}{\sigma}\, P\, \varphi\right)^{\sigma-1} R,$$

$$\pi(\varphi) = \frac{r(\varphi)}{\sigma} \;-\; f.$$

Under the baseline Melitz model, monopolistic competition implies that each firm sets its price as a constant markup over its marginal cost, where the markup is given by $\sigma/(\sigma-1)$:

$$p(\varphi) \;=\; \frac{\sigma}{(\sigma-1)\varphi}. \tag{5}$$

**Equilibrium.** Firms choose $p(\varphi)$ to maximize period profits under monopolistic competition. A firm with productivity $\varphi$ enters or stays in the market if and only if operating profits exceed zero. In equilibrium:

- *Zero-Cutoff-Profit (ZCP) Condition:* $\pi(\varphi^*) = 0$. Only firms with $\varphi > \varphi^*$ enter or survive.
- *Free-Entry (FE) Condition:* The expected net present value of entrants' profits equals the sunk cost $f$.
- *Price Index:* $P$ satisfies

$$P = \left[ \int p(\omega)^{1-\sigma} \, d\omega \right]^{\frac{1}{1-\sigma}}.$$

These conditions imply that the cutoff productivity $\varphi^*$ is determined endogenously—only firms with $\varphi > \varphi^*$ earn non-negative operating profits. Simultaneously, the free-entry condition ensures that potential entrants break even on average, while the price index condition normalizes aggregate demand.

We now consider two contrasting explanations for the emergence of superstar firms. In the "market power" view, an industry-wide increase in markups raises the effective price index, which lowers the minimum productivity threshold $\varphi^*$ required for profitable entry. As a result, more low-ability firms can enter, increasing the quantity of new firms while reducing average quality. In contrast, the "productivity" view posits that only firms with exceptionally high $\varphi$ can profitably overcome the fixed cost barrier, which raises $\varphi^*$ and results in fewer entrants of higher average quality.

| | **Market Power** | **High Productivity** |
|---|---|---|
| **Quantity of new businesses** | Increases | Decreases |
| **Quality of new businesses** | Decreases | Increases |

**Table 1:** Effects of Superstars on New Businesses: Market Power vs. Productivity Explanations

## 2.2 Selective Market Power

While higher quality of new entrants would rule out *universal* higher markups (which would imply rising entry), superstar firms might still exercise *selective* market power. In this scenario, only superstar firms charge $m_{\text{superstar}} > \sigma/(\sigma - 1)$ above the baseline monopolistic competition level given by equation (5), potentially through regulation or strategic behavior that disproportionately hinders weaker competitors. In this section, we discuss how measuring superstar employment and wages can help rule out the selective market power explanation.

**Superstar Employment.** Firms use labor $L_i$ as the sole input, and demand for labor is given by

$$L_i(\varphi) \;=\; \frac{q_i(\varphi)}{\varphi} \;=\; \left(\frac{m_i/\varphi}{P}\right)^{-\sigma} \frac{R}{P}\,\frac{1}{\varphi},$$

where $\varphi$ is firm productivity, $P$ is the CES price index, and $R$ is total income. This expression implies that $L_i'(\varphi) > 0$: higher productivity leads to a lower price, more output, and thus greater labor demand despite more efficient production. As a result, under the productivity explanation, rising concentration reflects reallocation toward high-$\varphi$ firms whose employment expands. In contrast, under selective markup power, firms restrict output to sustain higher prices, resulting in weaker employment growth.

**Superstar wages.** In the baseline model with competitive labor markets, a productivity-driven increase in superstar firms' market share implies both higher employment and a larger total wage bill while maintaining constant wages per worker. Moreover, if superstar firms face an upward-sloping labor supply or engage in rent-sharing, their growing scale also translates into higher wages per worker (Song et al., 2019). In contrast, under a selective market power explanation, employment grows less, and wages per worker remain flat or even decline, resulting in a relatively lower total wage bill and no increase in wages per worker. Both scenarios can produce the observed declining labor share (Autor et al., 2020; Bauer and Boussard, 2020): in the productivity case, value-added rises faster than payroll, while in the market power case, profits expand at the expense of both wages and employment. However, the joint observation of rising wages per worker and expanding total wage bills at superstar firms provides stronger support for the productivity-based explanation.

# 3 Data and Empirical Strategy

## 3.1 Data sources

We construct a three-digit industry panel from 1994 to 2014 using French administrative data provided by the French Statistical Office (INSEE).

**Firm registry.** Our primary variable of interest is the number of new business creations, measured using the firm registry (*SIRENE CREATIONS*), which contains the universe of firms registered in France from 1994 to 2014. To focus on actual firm creations, we exclude firms starting with more than 100 employees in their first year because they may reflect spin-offs, acquisitions, or

reorganizations rather than genuine start-ups. We follow Landier and Thesmar (2008) by removing new firms whose accounts are not reported within their first two years. We further restrict the sample to firms whose employment figures are consistent within a margin of 20 employees across the registry and payroll databases.

**Entrepreneur survey.** To analyze the long-term evolution in new business quality, we use a large-scale survey of new entrepreneurs (*SINE*) conducted by INSEE every four years from 1994 to 2014. This survey offers two key advantages: it is representative of the new business population and provides a large set of founder and startup characteristics.[3] Again, we focus on actual firm creations by excluding firms starting with more than 100 employees in their first year, new subsidiaries of existing companies, firms whose accounts are not reported within their first two years, and firms that do not appear in the firm registry.

**Tax files data.** We obtain firm sales and industry classifications from tax files (*FICUS* for 1994–2007 and *FARE* for 2008–2014) used by the Ministry of Finance for corporate tax collection. Industries are classified using the French NAF2 system (*Nomenclature des activités Francaises*).[4] After excluding financial, agricultural, household, and predominantly public sectors due to inconsistent reporting, our sample includes 152 industries.

For consistent concentration measures across years, we focus on approximately the 80% of firms that appear throughout the sample period, accounting for over 95% of total sales.[5]

**Ownership data.** To identify the largest "superstar" firms in each industry, we use ownership links data (*LIFI*) to construct business group entities as of their 2014 boundaries. This approach allows us to accurately measure firm size by consolidating subsidiaries at the group level. We retrospectively apply these 2014 group boundaries to account for mergers and acquisitions that might otherwise create discontinuities in our measures of firm size.

[3]The survey covers approximately 25% of entrepreneurs who started or took over a business in France in a given survey year. The response rate is high (approximately 80%) due to its official nature. The survey captures entrepreneurs' sociodemographic characteristics, education, experience, motivations for starting the firm, and initial business conditions (e.g., financing, market research, customer prospects).

[4]To maintain consistent industry codes throughout our sample period, we handle the 2008 transition from NAF1 to NAF2 classification by calculating transition probabilities based on firms that existed both before and after the change. We retain the latest NAF2 code for these firms and use the probabilities to assign NAF2 codes to firms created before the classification change.

[5]While firms operate under different tax regimes, with new regimes emerging during our sample period, the three primary firm types (BIC-RN, BIC-RSI, and BA-RN) are consistently present, with BIC-RN firms accounting for approximately 90% of sales and employment.

**Employer payrolls** The payroll data (*DADS*) provides employment information for all employer firms, as payroll tax filing is mandatory.

Panel A of Table 2 presents summary statistics for our variables of interest at the 3-digit industry level, both in levels and long differences between 1994 and 2014. Panel B reports characteristics of new entrepreneurs in the SINE survey conducted every four years between 1994 and 2014. In our sample, 31% of entrepreneurs hold college degrees (minimum two years), 14% previously worked as executives or CEOs, and 25% are "serial' entrepreneurs, i.e., have previously founded a business. Appendix A1 provides detailed variable descriptions.

### 3.2 Empirical Strategy

Our empirical approach follows a long-differences specification similar to Autor et al. (2020). We regress the change in new firm formation from 1994 to 2014 on the change in industry concentration over the same period, with controls for initial conditions and pre-trends:

$$\Delta Y_{i,1994\text{–}2014} = \alpha + \beta \, \Delta\text{Concentration}_{i,1994\text{–}2014} + \mathbf{X}'_{i,1994} \, \gamma + \epsilon_i, \tag{6}$$

where $\Delta Y_{i,1994\text{–}2014}$ is the change in the logarithm of new firm formation in industry $i$, $\Delta\text{Concentration}_{i,1994\text{–}2014}$ is the change in one of our concentration measures (e.g. Top 20 Index or HHI), and $\mathbf{X}'_{i,1994}$ denotes baseline industry controls (e.g. size, productivity, demographic composition).

Previous research has identified demographic changes and policy changes as possible drivers of changes in entrepreneurship or changes in competition. A key identification concern in our setting is that such shocks could simultaneously increase concentration and dampen entry in the cross-section of industries. To address this, we include an extensive set of initial (pre-1994) covariates that might drive both outcomes, such as demographic characteristics of entrepreneurs, industry-level productivity, and pre-trends in growth. We also measure concentration excluding new entrants to avoid mechanically overstating the link between fewer startups and higher market shares for incumbents. Finally, we run analogous regressions on five-year intervals to confirm that long-run patterns are not driven by transitory shocks. Across these checks, the relationship between rising concentration and falling new firm formation remains strong, supporting the view that increasing industry dominance is associated with heightened barriers to entry.

# 4 Results

## 4.1 Trends in Industry Concentration and New Entry

### 4.1.1 Business formation has decreased

Figure 1 presents four facts on the long-term evolution of business creation in France from 1994 to 2014, aggregating industry-level estimates at the year level.

**Panel A.** Panel A plots the total number of new businesses registered annually in the raw firm registry data before any sample restrictions. While recent literature documents a secular decline in business dynamism and new firm formation across developed economies (e.g., Decker et al., 2016a; Akcigit and Ates, 2021), the raw data shows a long-term increase in business formation, characterized by two distinct structural breaks that coincide with significant policy changes.

The first structural break occurs after 2002, following the implementation of the PARE reform enhancing unemployment insurance protection for entrepreneurs (Hombert et al., 2020). The annual number of new firms began steadily increasing from approximately 220,000 in 2002 to 330,000 by 2008. A second, more pronounced break appears in 2009 with the introduction of the "auto-entrepreneur" (later renamed "micro-entrepreneur") status, which simplified the business creation process (Landier, Szomoru, and Thesmar, 2016). The reform triggered an immediate increase in annual business creation from approximately 330,000 in 2008 to over 500,000 in 2009. While this number moderated after the initial surge, it stabilized at around 450,000 annual creations - significantly above pre-2009 levels.

**Panel B.** Following Haltiwanger, Jarmin, and Miranda (2013) who show that not all new businesses contribute equally to economic growth, Panel B focuses on economically meaningful business creation by examining firms consistently reported in tax files. This subset of firms, which represents approximately 80% of all firms and accounts for over 95% of total sales, excludes empty shells and entrepreneurs who do not intend to grow and hence have limited economic impact (Pugsley and Hurst, 2011). In contrast to the raw data and consistent with the existing literature, Panel B shows a secular decline in all types of new business formation (in green), dropping from about 120,000 annual creations in 1994 to approximately 90,000 in 2014 (a 25% decline). The decline is even more pronounced when focusing on employer firms (in orange), which decreased from about 60,000 annual creations in 1994 to approximately 40,000 in 2014 (a 33% decline).

While the 2002 and 2009 policy changes remain visible in the data, their impacts differ from what we observe in Panel A. The 2002 reform led to a temporary increase in the creation of these traditional business types, with firm creation rising from 110,000 in 2002 to 135,000 in 2006 (a 23% increase) before beginning to decline. The 2009 reform had a limited impact on these categories of firms.

**Panel C.** Panel C plots entry rates computed by dividing the number of new businesses by the total number of existing firms, both for all firms (in green) and employer firms only (in orange). The data reveals three distinct periods. First, a sharp decline from 1994 to 2002, with the overall entry rate falling from 9% to 6% and the employer entry rate dropping from 8.5% to 5%. Second, a period of relative stability between 2002 and 2009, with entry rates remaining around 6% for all firms and 5% for employer firms. Finally, entry rates start declining again after 2009, with rates falling to approximately 5% for all firms and 4% for employer firms by 2014.

This long-term decline in entry rates mirrors the evolution in the number of new businesses documented in Panel B. Moreover, the magnitude of this decline aligns with patterns documented in other developed economies. In the United States, Decker et al. (2014) find that the firm entry rate fell from approximately 12% in the late 1980s to about 8% by 2011, representing a decline of roughly one-third in the pace of business formation. The French experience appears similar, with entry rates declining by approximately 44% (from 9% to 5%) over our sample period.

**Panel D.** Following Haltiwanger, Jarmin, and Miranda (2013) who document the outsized role of young firms in job creation and economic dynamism, Panel D examines the evolution of young firms' contribution to aggregate economic activity. We define young firms as those aged five years or less, though our results are robust to alternative definitions. The figure plots the share of aggregate employment (in green), output (in blue), and value-added (in red) accounted for by young firms.

Between 1994 and 2002, young firms' shares remained relatively stable, accounting for approximately 17% of employment, 14% of output, and 13% of value-added. However, after peaking in 2002, these shares began declining steadily. By 2014, young firms' share had fallen to 13% of employment, 8% of output, and 7% of value-added, suggesting that young firms play an increasingly diminished role in the economy. These findings are consistent with Decker et al. (2016b) who show that young firms' share of employment has declined since 2000 in the US.

Understanding the sources of these substantial declines requires examining not only changes in

the quantity of new businesses documented in previous panels, but also potential shifts in their quality and growth potential over time.

#### 4.1.2 Founders of new businesses are higher-quality

As young firms drive job creation and productivity growth (Haltiwanger, Jarmin, and Miranda, 2013), the decline documented above is often interpreted as reduced economic dynamism. However, economic dynamism depends not just on the quantity but also the quality of new businesses (Schoar, 2010; Sterk, Sedláček, and Pugsley, 2021). Understanding this decline requires examining whether firms of different quality are equally affected.

Figure 2 presents evidence on the evolution of innate entrepreneur characteristics linked to firm performance. The share of college-educated entrepreneurs rose steadily from 25% to 42% between 1994 and 2014 (Panel A).[6] Prior research shows education strongly predicts firm survival and growth (Cabral and Mata, 2003; Queiró, 2022). The share of entrepreneurs with executive or CEO experience increased from 12% to 19% (Panel B), while serial entrepreneurs, whose firms exhibit superior performance (Gompers et al., 2010), grew from 21% to 27% (Panel C). Simultaneously, entrepreneurs without high school degrees fell from 55% to 38% (Panel D). These patterns suggest a systematic shift toward higher-ability entrepreneurs (Lazear, 2005; Parker, 2018).

We validate these *ex-ante* characteristics' predictive power by examining their relationship with subsequent firm outcomes in Appendix Table A2. For survival, having a college degree increases probabilities by 3 percentage points at 3 years, 3.9 at 5 years, and 4.3 at 7 years. Former executives/CEOs show stronger effects, with survival increases of 4.4, 3.9, and 3.9 percentage points across these horizons. For revenue, the effects are largest at the 5-year horizon. Former executives achieve 51% ($e^{0.41} - 1 = 0.51$) higher revenue at 3 years, rising to 60% at 5 years, before declining to 14% by year 7. College graduates and serial entrepreneurs show similar patterns, with effects initially increasing before falling. The employment effects mirror these patterns. Founder age shows less consistent effects across outcomes and horizons.

We use pre–entry characteristics—such as education and prior experience—which are determined before firm formation and therefore less subject to adjustment once the business begins. Other characteristics that predict success but are not innate, such as initial financing or early hiring, do not show such clear long-term trends. As discussed in Section 4.3, this likely occurs because these

[6] All percentages are computed by collapsing the data at the cohort level using sampling weights from the SINE survey.

characteristics adjust to the changing economic conditions that deter low-ability entrepreneurs from entering.

#### 4.1.3 Concentration has increased

Figure 3 presents evidence of the increase in market concentration in France between 1994 and 2014. Following Lashkari, Bauer, and Boussard (2024), we plot the cumulative change in various concentration measures. For each 3-digit industry and year, we compute the shares of the top 4, 8, and 20 firms in total industry sales and the industry's Herfindahl-Hirschman index (HHI). Taking 1994 as our baseline year, we first calculate year-to-year changes in each concentration measure at the industry level. We then compute sales-weighted yearly averages of these changes across industries and cumulate these changes over time starting from 1994. The figure shows a marked rise in concentration across all metrics starting around 1996. The market shares of the top 4, 8, and 20 firms within 3-digit industries all increase by approximately 4 p.p., and the increase in the HHI mirrors these patterns, rising by around 150 p.p. over the sample period.

The rise in concentration aligns with evidence for the United States documented by Covarrubias, Gutiérrez, and Philippon (2020), Autor et al. (2020), and Kwon, Ma, and Zimmermann (2024), among others. Using the same French administrative data, Lashkari, Bauer, and Boussard (2024) and De Ridder (2024) also link rising concentration to firms' use of intangible inputs. The timing of this increase - starting in the mid-1990s - is particularly notable as it coincides with the broader availability of information technology and software.

### 4.2 Industries with rising concentration have fewer new firms

Table 3 presents the estimates from long-differences regressions analyzing the impact of industry concentration on new firm formation in French industries. The dependent variable is the logarithm of the number of new firms by industry, and all regressions are weighted by the *ex-ante* number of new firms in each industry.

The baseline results are shown in Panel A, where the coefficients on all concentration measures—Top 20 Index, Top 8 Index, Top 4 Index, and Log HHI—are negative and statistically significant at the 1% level. For instance, a one-unit increase in the Top 20 Index is associated with a 2.82 log-point decrease in the number of new firms. Similar magnitudes are observed for the Top 8 Index ($-2.73$) and Top 4 Index ($-2.85$), while the log HHI has a coefficient of $-0.22$, consistent with the smaller scale of this variable. These results suggest that higher industry concentration systematically

corresponds to lower rates of new firm entry, consistent with theories of reduced competition and heightened entry barriers in concentrated markets (Syverson, 2019).

Panel B incorporates additional controls. First, controlling for the firm growth rate ensures that the relationship between concentration and new firm formation is not driven by faster-growing industries, which might naturally attract more new entrants. Second, controlling for initial value added accounts for differences in industry size, ruling out the possibility that the observed effects are purely size-related. After including these controls, the coefficients on concentration measures remain negative and statistically significant, though slightly attenuated. For example, the Top 20 Index coefficient decreases to $-2.35$, and the log HHI coefficient declines to $-0.16$.

In Panel C, the results are explored within specific subsets of industries and with alternative measures of concentration. Using the industries studied by Autor et al. (2020), the coefficients remain negative and significant, similar to our main results. Restricting the analysis to growing industries similarly yields negative coefficients, confirming that the results are not driven solely by industries experiencing decline. We also show results using alternative measures of industry concentration — using employment and value-added instead of industry sales. For employment-based concentration, the Top 20 Index has a coefficient of $-1.51$, while the value-added-based concentration measure yields a Top 20 Index coefficient of $-2.57$. The results remain significant throughout.

Previously, we showed that both the number of new firms and their contribution to aggregate economic activity has declined. In Panel D, we present analogous results in the cross-section of industries, examining the relationship between industry concentration and the share of sales, value-added, and employment contributed by young firms. Higher concentration is associated with a reduced economic share for young firms across all metrics. For instance, the Top 20 Index has a coefficient of $-0.33$ for sales share, $-0.13$ for value-added share, and $-0.14$ for employment share. These results suggest that concentration not only reduces the entry of new firms but also diminishes the relative contribution of young firms to the industry's total economic activity. This is consistent with evidence of declining business dynamism in other contexts.

We also relate our findings to research showing changes in the skewness of the firm growth distribution (Decker et al., 2016a). Figure X compares the dispersion of growth rates in the upper (90-50) and lower (50-10) percentiles of the distribution, differentiating between young and mature firms. The results indicate that, similar to the U.S. findings, the positive skewness in employment growth has declined over time, with a more pronounced effect for young firms than for mature

firms. However, when examining sales growth, this pattern does not hold, and the relative growth rates are constant.

Appendix Table A4 presents additional robustness checks using alternative specifications. First, the regressions are estimated using five-year differences instead of long differences. The coefficients remain negative but are smaller in magnitude, reflecting the shorter time horizon. For instance, the Top 20 Index coefficient is $-1.34$. Next, we limit the analysis to concentration measures that exclude new firms, focusing on changes in concentration driven solely by existing firms. This approach is one way we address the mechanical relationship between entry and concentration (later, we will show results for firm exit, which are an important reason that concentration changes but is not mechanically linked to entry). The coefficients remain negative and significant, with the Top 20 Index coefficient at $-0.92$. Finally, the sample is split into two periods (1994–2004 and 2004–2014). The results are consistent across both periods, with Top 20 Index coefficients of $-2.84$ and $-2.70$, respectively, both significant at the 1% level.

Our results do not depend on any particular models of why concentration has increased, but they are consistent with a growing productivity gap between "superstar" firms and others in industries with rising concentration. For example, Akcigit and Ates (2021) and Akcigit and Ates (2023) argue that a growing gap between "leader" and "laggard" firms can explain rising concentration in the United States. Estimates in Figure A5 of the Appendix show that higher productivity in the largest employers is associated with greater concentration. The results indicate that higher concentration, as measured by the Top 20, Top 8, and Top 4 concentration indices, is positively associated with the productivity of these leading firms. For example, a 1-unit increase in the Top 20 concentration index is associated with a 2.06-unit increase in productivity, significant at the 5% level. Similarly, the Top 8 and Top 4 indices exhibit positive and significant relationships with productivity, with comparable effect sizes.

One explanation for changing patterns of entrepreneurship is changes in aggregate demographics (Karahan, Pugsley, and Şahin, 2024). Since different industries attract different groups of entrepreneurs, demographic changes provide an alternative possible explanation for our results. In Table A6, we use demographic information collected by the SINE survey to study how controlling for *ex-ante* demographic characteristics affects our results. In addition to the education and ability variables we study in Table 4, we add controls for entrepreneurs' previous work and their age. Our estimates are slightly larger but overall very similar. While demographics may play an important role for explaining aggregate patterns, this finding suggests that they do not explain the cross-industry

results we present.

To evaluate whether similar patterns of industry concentration affecting new firm formation hold in the United States, we extend our analysis using U.S. data, shown in Table A7. Although the available data for the U.S. are more limited than for France, we provide motivating statistics that offer suggestive evidence. The concentration measures are sourced from the U.S. Economic Census, conducted every five years, which provides industry-level concentration ratios such as the Top 4, Top 8, Top 20, and Top 50 firm concentration ratios. Startup data are obtained from the Business Dynamics Statistics (BDS), which annually reports on business openings and employment across U.S. establishments. This combination of data allows us to analyze changes in new firm formation and the employment share of new firms in relation to industry concentration.

The regression results, summarized in Table A7, indicate that higher industry concentration in the U.S. is associated with a decrease in new firm entry and a reduction in the employment share of new firms, echoing our findings from the French context. Specifically, the coefficients for the change in log new startups are negative and statistically significant across all concentration measures, ranging from $-0.02$ to $-0.03$. This suggests that industries with higher concentration ratios experience fewer new startups. Similarly, the change in new firm employment share is negatively associated with concentration measures, with significant coefficients observed for the Top 8, Top 20, and Top 50 concentration ratios. These findings provide suggestive evidence that rising industry concentration in the U.S. correlates with a decline in entrepreneurial activity, reinforcing the notion that industry concentration may have similar effects on new firm dynamics across different economies.

### 4.3 Industries with rising concentration are higher quality

Next, we estimate the cross-sectional relationship between changes in concentration and measures of firm quality. The results are shown in Figure 4. The mechanisms we describe naturally imply that the lowest-performing young firms would be driven out before high-performers. As a result, we would expect that, even as the number of young firms decreases, the effects should be smaller on the number of very high growth firms.

We begin in Panel A with *ex-ante* founder characteristics. The estimates show that higher market concentration is generally associated with improved quality outcomes. Specifically, the "Has College" variable exhibits positive and statistically significant coefficients across the Top 20 Index, Top 8 Index, Top 4 Index, and Log HHI measures. This suggests that increased concentration is

linked to higher levels of college attainment, implying that concentrated markets may facilitate better educational investments and outcomes.

Similarly, the "Previously Working" variable shows a positive and significant relationship with the Top 4 Index, indicating that firms with prior work experience tend to perform better in more concentrated markets. This relationship highlights the potential for established firms within concentrated industries to leverage their experience for enhanced quality outcomes.

However, the results for the "No Bac" variable present a more mixed picture. While some coefficients are negative, they are not consistently significant across all concentration measures. Overall, the findings provide suggestive evidence that higher market concentration is linked to higher quality, although the mixed significance and direction of some coefficients indicate that this relationship is somewhat mixed.

In Panel B we look at the *ex-post* likelihood that a firm will have high growth outcomes. Specifically we study the share of high-growth startups in concentrated industries. The results indicate that higher concentration is associated with an increased proportion of young firms achieving significant growth. We measure the share of high-growth firms as the share of firms in each industry that start with turnover below 500,000 euros who, within five years, exceed a turnover of 500,000 euroes and 1 million euros..[7]

Higher concentration is robustly associated with a larger share of high-growth firms. For firms surpassing the 500,000 euros output threshold within five years, the Top 20 Index coefficient is 0.05. For the 1 million euros threshold, the coefficient is 0.02. These positive coefficients suggest that concentrated industries may filter out less successful firms while enabling a higher share of high-growth startups to persist. This pattern aligns with theoretical models suggesting that higher entry barriers may selectively screen for more productive entrants (Melitz, 2003).

Panel C studies how rising concentration is associated with exit of incumbent firms. We study the share of 1994 firms that remain in 2014. Nearly three-quarters of all firms that exist in 1994 exit by 2014 through a combination of closure (the most common outcome), acquisition and reorganization. But the likelihood of firm survival varies across industries. The first row shows that firm survival is robustly negatively associated with rising concentration. In industries where concentration has increased, overall survival fell, and this was more so for firms with below-median productivity, measured as sales per worker, than above-median productivity. Firms in the bottom quartile of sales per worker were no worse off than below the median, and in fact slightly better. Finally, the

[7]We prefer to measure the share of high growth young firms rather than the log-count to avoid dropping zeroes

effect on firm survival is concentrated on small firms. Large firms — those with above 50 employees — show no association between survival and superstar share. Overall, higher superstar share is associated with the exit of small and unproductive firms.

# 5 Discussion

While our detailed cross-sectional evidence comes from France, the time series patterns we document align with findings from other developed economies. The decline in entry rates we observe mirrors the U.S. experience documented by Decker et al. (2014), who find entry rates fell from approximately 12% to 8% between the late 1980s and 2011. Our finding of rising entrepreneur quality parallels U.S. evidence from Guzman and Stern (2020), who document the increasing quality of entrepreneurship. The long-term rise in concentration for France coincides with similar trends documented for the U.S. (e.g., Autor et al., 2020; Kwon, Ma, and Zimmermann, 2024). To the best of our knowledge, our paper is the first to show that these trends are related: industries with greater increases in concentration exhibit more pronounced declines in firm entry but improved average entrant quality.

The cross-sectional relationship we document between rising concentration and falling entry is consistent with theories that emphasize technological changes that disproportionately benefit the most productive firms (Lashkari, Bauer, and Boussard, 2024). The timing of increased concentration - beginning in the mid-1990s with the broader availability of information technology - supports this technological interpretation.

While other factors like demographic changes (Hopenhayn, Neira, and Singhania, 2022; Karahan, Pugsley, and Şahin, 2024) and skill-biased technical change (Salgado, 2020) likely play a role, they cannot fully explain the systematic relationship we document between concentration and entrepreneurship across industries. Our results are particularly consistent with models where new technologies simultaneously raise barriers to entry for low-ability entrepreneurs while preserving opportunities for high-ability entrants.

Our analysis helps reconcile two seemingly contradictory facts in the literature: declining growth outcomes by young firms (Decker et al., 2016a) and rising average entrant quality (Guzman and Stern, 2020). Our findings suggest this pattern emerges because technological changes deter entry by lower-ability entrepreneurs while maintaining opportunities for higher-ability founders.

The patterns we uncover suggest that declining entrepreneurship may reflect efficient reallocation rather than market dysfunction. As Autor et al. (2020) argue, the rise of superstar firms appears

driven by their superior productivity rather than anticompetitive behavior. Our finding that concentration primarily deters lower-quality entrants while preserving opportunities for high-ability entrepreneurs supports this interpretation. However, the decline in entrepreneurship by lower-ability individuals may still have important distributional implications, even if it enhances aggregate efficiency.

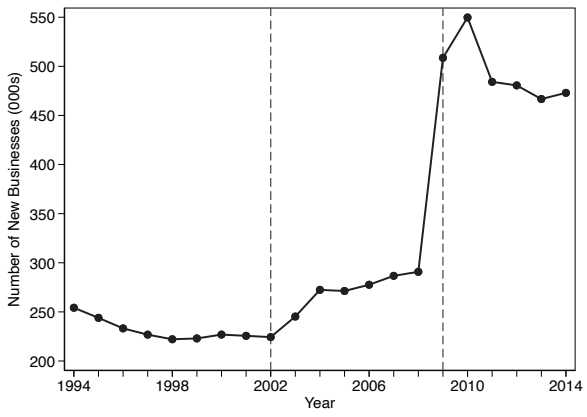
# 6 Conclusion

This paper shows that the decline in business dynamism and the rise of superstar firms are two sides of the same coin. Using rich French administrative data, we document five key facts: a significant decline in new business formation, rising quality of new firms, increasing market concentration, fewer entrants in concentrated industries, and higher-quality entrepreneurs in those same industries.

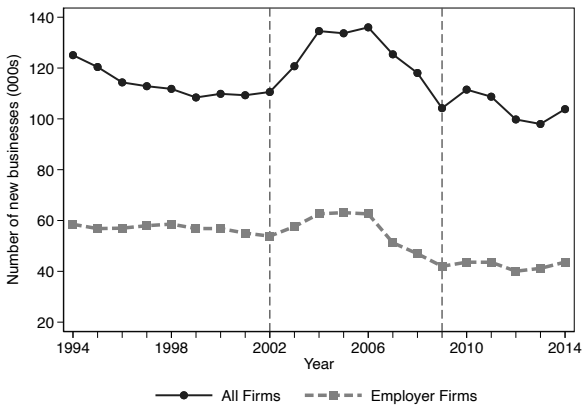
Our empirical findings support the productivity-based view of superstar firms. We develop a model showing that market power should lead to more entry and lower-quality entrepreneurs by making it easier for firms to cover fixed costs, whereas a productivity-based explanation predicts both fewer and higher-quality entrepreneurs. Additional evidence that superstar firms expand employment and raise wages further rules out an alternative explanation where only superstar firms benefit from market power, as such firms would instead reduce employment to maintain high prices.

The changing nature of market competition, driven by more productive superstar firms, is reshaping the entrepreneurial landscape. While new business formation has decreased, the rise in average entrant quality partially offsets this decline. By raising entry barriers that only high-ability entrepreneurs can overcome, this shift may enhance resource allocation efficiency, though potentially at the expense of low-ability, subsistence entrepreneurs.

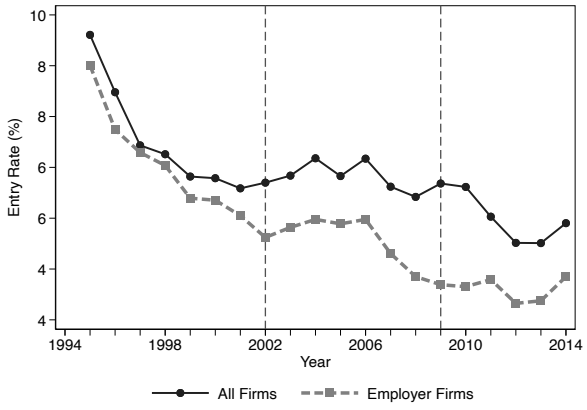
# Figures



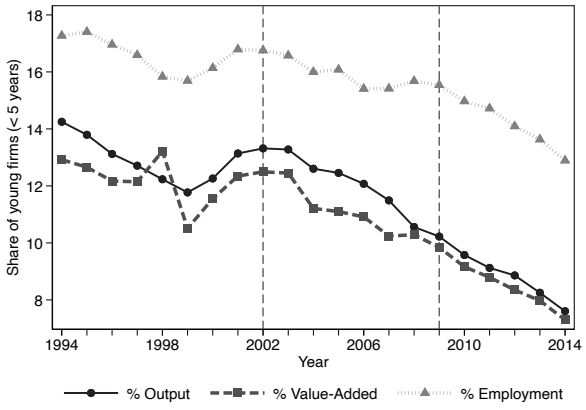

Panel A: Raw Number of New Firms




Panel B: New Employer Firms

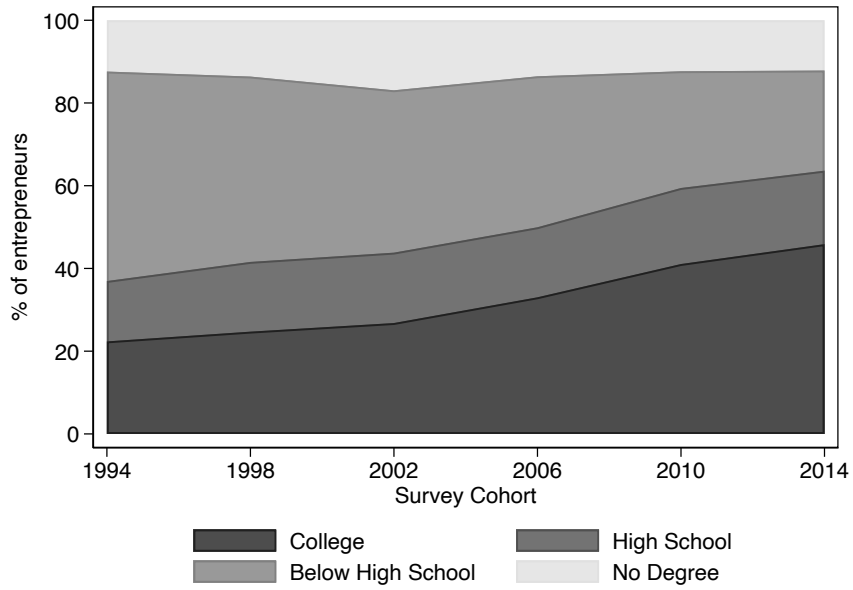



Panel C: Entry Rate

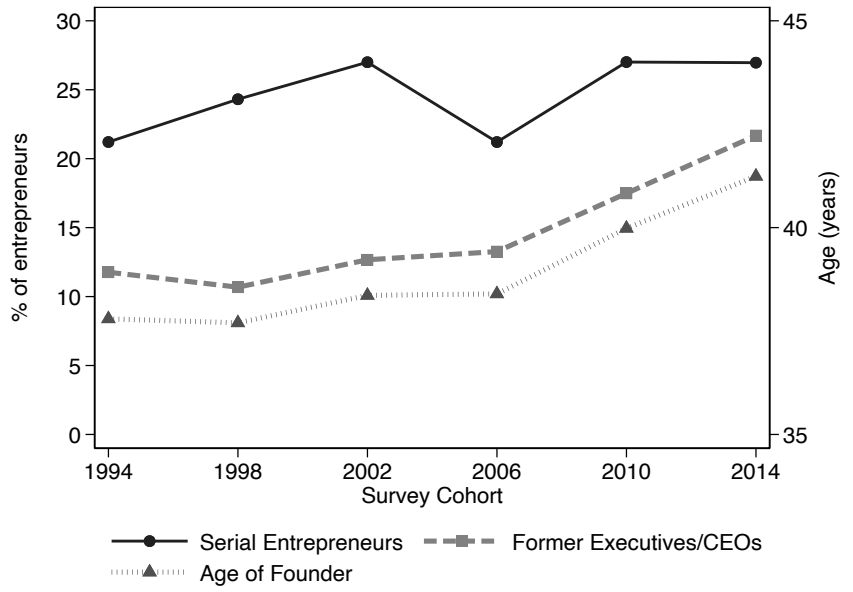



Panel D: Young Firms' Share of Economic Activity

**Figure 1: Evolution of Business Formation, 1994-2014.** This figure shows the evolution of business formation in France from 1994 to 2014. Panel A plots the raw number of new firms registered annually. Panel B shows new employer firms. Panel C presents entry rates computed as new businesses divided by total existing firms. Panel D plots young firms' ($\leq$5 years) share of aggregate employment, output, and value-added. Source: SIRENE, FICUS/FARE, and DADS databases.




Panel A: Educational Background of Entrepreneurs




Panel B: Entrepreneur Experience and Age

**Figure 2: Evolution of Entrepreneur Characteristics, 1994-2014.** This figure shows trends in French entrepreneur characteristics from 1994 to 2014. Panel A presents the educational composition. Panel B shows the shares of serial entrepreneurs and former executives/CEOs (left axis) and average founder age (right axis). All statistics are computed using SINE survey sampling weights. Source: SINE survey.

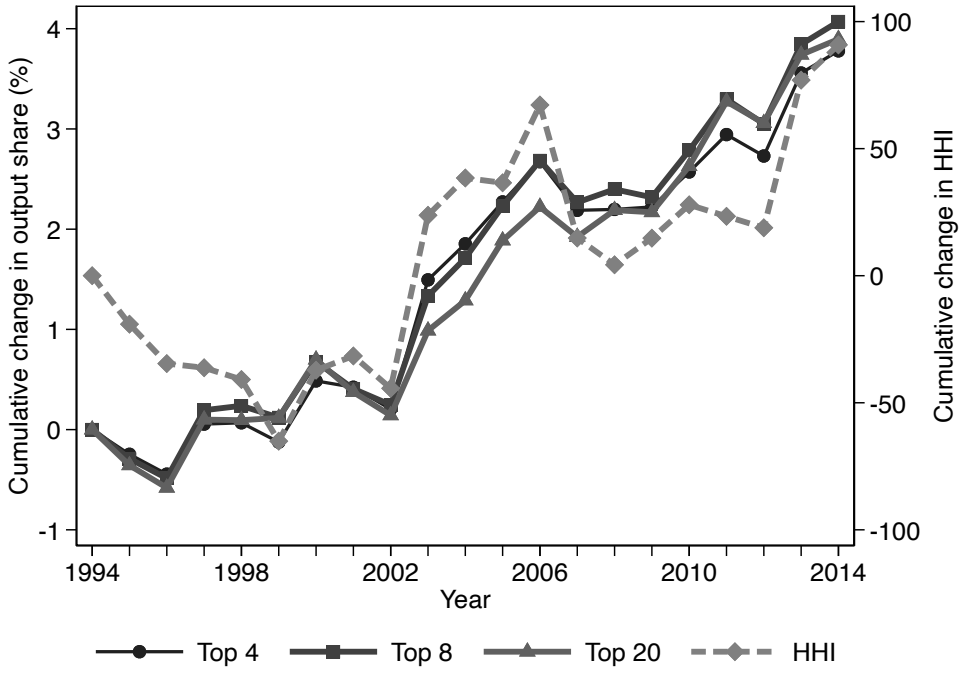



**Figure 3: Evolution of Market Concentration, 1994-2014.** This figure shows cumulative changes in market concentration measures starting from 1994 baseline. Market shares are computed for top 4, 8, and 20 firms in each 3-digit industry. HHI is the Herfindahl-Hirschman Index. All measures are equal-weighted averages across industries. Source: FICUS/FARE databases.

# Tables

**Table 2:** Summary Statistics 1994–2014.

| | Mean | Sd | 25% | 50% | 75% | 95% | 99% | N |
|---|---|---|---|---|---|---|---|---|
| *Panel A: All Firms (Tax Files and Firm Registry)* | | | | | | | | |
| *Levels* | | | | | | | | |
| Number of New Firms | 738.45 | 1635.32 | 22.00 | 95.00 | 584.50 | 3666.00 | 8830.00 | 3,648 |
| Young Firms Share (Sales) | 0.11 | 0.10 | 0.05 | 0.09 | 0.15 | 0.29 | 0.45 | 3,648 |
| Young Firms Share (Employment) | 0.16 | 0.09 | 0.09 | 0.14 | 0.21 | 0.33 | 0.42 | 3,344 |
| Top 20% Share | 0.50 | 0.26 | 0.29 | 0.48 | 0.71 | 0.94 | 0.99 | 3,648 |
| Top 8% Share | 0.39 | 0.25 | 0.19 | 0.35 | 0.55 | 0.88 | 0.96 | 3,648 |
| Top 4% Share | 0.31 | 0.23 | 0.14 | 0.26 | 0.43 | 0.81 | 0.93 | 3,648 |
| HHI Index | 755.19 | 1302.92 | 84.72 | 271.59 | 721.16 | 3441.92 | 6997.22 | 3,648 |
| *Long-term changes (1994-2014)* | | | | | | | | |
| Δ Number of New Firms | -0.01 | 0.12 | -0.05 | -0.03 | 0.00 | 0.20 | 0.44 | 152 |
| Δ Young Firms Share (Sales) | -0.07 | 0.08 | -0.09 | -0.06 | -0.03 | 0.05 | 0.08 | 152 |
| Δ Young Firms Share (Employment) | -0.04 | 0.09 | -0.08 | -0.05 | 0.00 | 0.09 | 0.18 | 152 |
| Δ Top 20% Share | 0.04 | 0.13 | -0.03 | 0.04 | 0.10 | 0.24 | 0.36 | 152 |
| Δ Top 8% Share | 0.04 | 0.13 | -0.01 | 0.04 | 0.10 | 0.26 | 0.43 | 152 |
| Δ Top 4% Share | 0.04 | 0.13 | -0.01 | 0.03 | 0.10 | 0.23 | 0.46 | 152 |
| Δ HHI Index | 90.83 | 778.64 | -14.95 | 32.63 | 212.39 | 1608.55 | 2578.11 | 152 |
| *Panel B: New Businesses (SINE survey)* | | | | | | | | |
| *Levels* | | | | | | | | |
| Has College Degree | 0.31 | 0.09 | 0.24 | 0.29 | 0.39 | 0.45 | 0.45 | 6 |
| CEO/Executive Experience | 0.14 | 0.04 | 0.12 | 0.13 | 0.17 | 0.21 | 0.21 | 6 |
| Serial Entrepreneur | 0.25 | 0.03 | 0.21 | 0.26 | 0.27 | 0.27 | 0.27 | 6 |
| No High School Degree | 0.49 | 0.10 | 0.39 | 0.51 | 0.58 | 0.60 | 0.60 | 6 |

*Notes*: This table contains summary statistics for the main entrepreneur characteristics we use in our analysis. Most variables are dummies so that the reported means stand for percentage in the category. The only exceptions are Nb. Employees *x*-Y and Sales *x*-Y. Appendix Table A1 provides a description of each variable. Sources: SINE survey, Tax files and DADS.

**Table 3:** Regression Results by Concentration Measure

| | Top 20 Index | Top 8 Index | Top 4 Index | Log HHI |
|---|---|---|---|---|
| **Panel A: Main Results** | | | | |
| Main Results | -2.82*** | -2.73*** | -2.85*** | -0.22*** |
| | (0.34) | (0.36) | (0.36) | (0.03) |
| **Panel B: Added Controls** | | | | |
| Growth Rate | -2.35*** | -2.26*** | -2.36*** | -0.16** |
| | (0.28) | (0.32) | (0.36) | (0.03) |
| Initial Value-Added | -2.95*** | -2.85*** | -2.94*** | -0.21** |
| | (0.28) | (0.32) | (0.36) | (0.03) |
| **Panel C: Specific Industries and Alternative Measures** | | | | |
| Autor et al. Industries | -2.82*** | -2.73*** | -2.85*** | -0.22*** |
| | (0.28) | (0.32) | (0.36) | (0.03) |
| Growing Industries | -2.49*** | -2.36*** | -2.46*** | -0.17** |
| | (0.28) | (0.32) | (0.36) | (0.03) |
| Employment-Based Concentration | -1.51** | -1.77** | -2.06** | -0.12*** |
| | (0.28) | (0.32) | (0.36) | (0.03) |
| Value-Added-Based Concentration | -2.57*** | -2.33*** | -2.32*** | -0.13 |
| | (0.28) | (0.32) | (0.36) | (0.03) |
| **Panel D: Young Firms' Economic Share** | | | | |
| Sales Share | -0.33*** | -0.34*** | -0.37*** | -0.02* |
| | (0.09) | (0.09) | (0.09) | (0.01) |
| Value-Added Share | -0.13*** | -0.13*** | -0.12** | -0.01 |
| | (0.09) | (0.09) | (0.09) | (0.01) |
| Employment Share | -0.14** | -0.13** | -0.14** | -0.01 |
| | (0.09) | (0.09) | (0.09) | (0.01) |
| **Panel E: Characteristics of Top-4 Superstar Firms** | | | | |
| Log(Employment) | 2.10447 | 2.27022 | 2.24431 | 0.28278 |
| | (0.36) | (0.36) | (0.36) | (0.03) |
| Log(Wages) | 2.56778 | 2.75730 | 2.70936 | 0.29550 |
| | (0.36) | (0.36) | (0.36) | (0.03) |
| Log(Wages per Employee) | 0.55774** | 0.57283** | 0.54236** | 0.01984 |
| | (0.26) | (0.26) | (0.26) | (0.03) |

*Notes*: This table reports the relationship between long-term changes (1994-2014) in industry concentration and new firm creation across three-digit industries in France. The dependent variable is the change from 1994 to 2014 in the (log) number of firm creations at the 3-digit industry level. The key independent variables are concentration measures, including the revenue share of the top 20, top 8, and top 4 firms, as well as the log of the Herfindahl-Hirschman Index (HHI). These measures are derived from administrative firm-level revenue data. Panel A reports the baseline estimates. Panel B introduces controls for industry growth and initial value-added. Panel C tests robustness to alternative concentration definitions, including employment- and value-added-based measures, and restricts the sample to industries identified in Autor et al. (2017) and those with positive sales growth. Panel D examines the economic share of young firms (within five years of entry) based on their share of industry sales, value-added, and employment. All regressions use weighted least squares, with weights equal to the number of firm creations in 1994. Standard errors are clustered at the industry level. Sources: Administrative firm-level data and industry classifications from Autor et al. (2017). Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

**Table 4:** Firm Quality

| | Top 20 Index | Top 8 Index | Top 4 Index | Log HHI |
|---|---|---|---|---|
| **Panel A: Founder Characteristics** | | | | |
| Previously CEO | 0.04 | 0.05 | 0.00 | 0.00 |
| | (0.08) | (0.09) | (0.12) | (0.01) |
| Previously Working | 0.07 | 0.11 | 0.18*** | -0.00 |
| | (0.11) | (0.11) | (0.11) | (0.01) |
| Has College | 0.13 | 0.14* | 0.18** | 0.02** |
| | (0.09) | (0.09) | (0.10) | (0.01) |
| No Bac | -0.04 | -0.07 | -0.06 | -0.00 |
| | (0.15) | (0.16) | (0.16) | (0.01) |
| **Panel B: Share of High-Growth Startups** | | | | |
| *Output Above 500k Euros* | 0.05*** | 0.05** | 0.04* | 0.00*** |
| | (0.01) | (0.01) | (0.01) | (0.00) |
| *Output Above 1mn Euros* | 0.02** | 0.02* | 0.02 | 0.00 |
| | (0.01) | (0.01) | (0.01) | (0.00) |
| **Panel C: Firm Survival** | | | | |
| Overall Survival | -0.18*** | -0.20*** | -0.23*** | -0.01 |
| | (0.06) | (0.06) | (0.06) | (0.01) |
| Above Median Productivity | -0.15** | -0.17** | -0.21*** | -0.01 |
| | (0.07) | (0.07) | (0.07) | (0.01) |
| Below Median Productivity | -0.20*** | -0.22*** | -0.25*** | -0.01 |
| | (0.06) | (0.06) | (0.07) | (0.01) |
| Bottom Quartile Productivity | -0.18*** | -0.21*** | -0.23*** | -0.01 |
| | (0.06) | (0.06) | (0.07) | (0.01) |
| Above 50 Employees | 0.01 | 0.03 | 0.06 | -0.02 |
| | (0.20) | (0.21) | (0.23) | (0.01) |
| Below 50 Employees | -0.18*** | -0.20*** | -0.23*** | -0.01 |
| | (0.06) | (0.06) | (0.06) | (0.01) |

*Notes*: This table reports the relationship between long-term changes (1994-2014) in industry concentration and various dimensions of firm quality across three-digit industries. The key independent variables are concentration measures, including the revenue share of the top 20, top 8, and top 4 firms, as well as the log of the Herfindahl-Hirschman Index (HHI). These measures are derived from administrative firm-level revenue data. Panel A reports long-difference estimates of CEO quality, including the incidence of prior CEO experience, previous working status, college attendance, and the absence of a baccalauréat (high-school degree). Panel B reports changes in the proportion of startups whose output exceeds 500,000 euros and 1 million euros, respectively. Panel C reports estimates of survival outcomes, including overall survival, survival stratified by productivity (above median, below median, and in the bottom quartile), and survival by firm size (above and below 50 employees). All regressions are estimated using weighted least squares with weights equal to the number of firm creations in 1994, and standard errors are clustered at the industry level. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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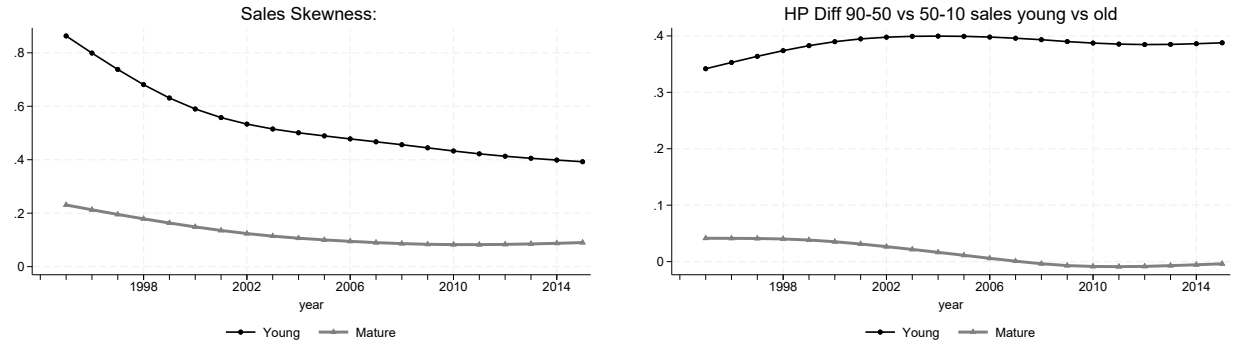
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# Appendix Figures




**(a)** Employment growth skewness

**(b)** Sales growth skewness

**Figure A1:** Comparison of skewness trends in employment and sales growth for young and mature firms. Panel (a) presents the difference between the 90th and 50th percentiles (90-50) and the 50th and 10th percentiles (50-10) of the employment growth rate distribution over time. The sample consists of continuing firms, and growth is measured as in Decker et al. (2016a). Consistent with findings from the U.S. (Decker et al., 2016a), the employment growth distribution exhibits a decline in positive skewness, with a more pronounced effect for young firms compared to mature firms. Panel (b) shows the analogous comparison for sales growth. It reveals a stable pattern in which the relative growth rates remain constant over time, indicating that the decline in skewness observed for employment growth does not extend to sales growth. Both figures apply Hodrick–Prescott filtering to extract long-run trends, with smoothing parameters set following standard practice for annual data.

# Appendix Tables

**Table A1:** Variable Descriptions

| Variable | Description |
|---|---|
| *A. Concentration Measures* | |
| Top 4 Index | Market share (as fraction of industry sales) of the 4 largest firms in each 3-digit industry. Source: Tax files (FICUS/FARE) and ownership data (LIFI) to account for business group structure. |
| Top 8 Index | Market share (as fraction of industry sales) of the 8 largest firms in each 3-digit industry. Source: Tax files (FICUS/FARE) and ownership data (LIFI). |
| Top 20 Index | Market share (as fraction of industry sales) of the 20 largest firms in each 3-digit industry. Source: Tax files (FICUS/FARE) and ownership data (LIFI). |
| Log HHI | Logarithm of the Herfindahl-Hirschman Index for each 3-digit industry, calculated as the sum of squared market shares. Source: Tax files (FICUS/FARE) and ownership data (LIFI). |
| *B. Business Formation Measures* | |
| Number of new firms | Count of new business registrations in each industry-year. Source: Firm registry (SIRENE). |
| Entry rate | Number of new businesses divided by the total number of existing firms in each industry-year. Source: Firm registry (SIRENE) and tax files (FICUS/FARE). |
| Young firms' share (employment) | Fraction of total industry employment accounted for by firms aged five years or less. Source: Employer payroll data (DADS) and tax files (FICUS/FARE). |
| Young firms' share (output) | Fraction of total industry output accounted for by firms aged five years or less. Source: Tax files (FICUS/FARE) and firm registry (SIRENE). |
| Young firms' share (value-added) | Fraction of total industry value-added accounted for by firms aged five years or less. Source: Tax files (FICUS/FARE) and firm registry (SIRENE). |
| *C. Entrepreneur Characteristics* | |
| Has College | Indicator equal to one if the entrepreneur has at least two years of post-secondary education. Source: SINE survey. |
| Previously Executive or CEO | Indicator equal to one if the entrepreneur previously worked as an executive or CEO. Source: SINE survey. |
| Serial Entrepreneur | Indicator equal to one if the entrepreneur has previously founded another business. Source: SINE survey. |
| No Bac | Indicator equal to one if the entrepreneur does not have a high school degree (baccalauréat). Source: SINE survey. |
| Blue-collar background | Indicator equal to one if the entrepreneur previously worked in a blue-collar occupation. Source: SINE survey. |

*Continued on next page*

Table A1 (continued)

| Variable | Description |
|---|---|
| Innovative Entrepreneur | Indicator equal to one if the entrepreneur reports introducing innovative products or processes. Source: SINE survey. |
| Previously Working | Indicator equal to one if the entrepreneur was employed before starting the business. Source: SINE survey. |
| Age | Age of the entrepreneur at the time of business creation. Source: SINE survey. |
| *D. Firm Performance Measures* | |
| Survival | Indicator equal to one if the firm survives after a given year. Source: Tax files (FICUS/FARE). |
| Revenue | Firm sales in a given year. Source: Tax files (FICUS/FARE). |
| Employment (3/5/7-Year) | Number of employees 3, 5, or 7 years after founding. Source: Employer payroll data (DADS). |
| High-growth startup (500k/1M) | Indicator equal to one if a firm starting with turnover below 500,000 euros exceeds 500,000 or 1 million euros within five years. Source: Tax files (FICUS/FARE). |
| *E. Industry and Firm Characteristics* | |
| Firm growth rate | Average annual growth rate of firms in each industry. Source: Tax files (FICUS/FARE). |
| Initial value-added | Total value-added of each industry in 1994. Source: Tax files (FICUS/FARE). |
| Sales per worker | Ratio of total sales to number of employees, a measure of labor productivity. Source: Tax files (FICUS/FARE) and employer payroll data (DADS). |
| Firm size | Number of employees per firm. Source: Employer payroll data (DADS). |
| Firm survival | Share of 1994 firms that remain in operation in 2014. Source: Tax files (FICUS/FARE). |

*Notes:* This table describes the variables used in our analysis. Concentration measures, business formation measures, and industry characteristics are constructed from firm registry (SIRENE), tax files (FICUS/FARE), and employer payroll (DADS) data. Entrepreneur characteristics are obtained from the SINE survey conducted by INSEE every four years from 1994 to 2014.

**Table A2:** Entrepreneur Characteristics and Firm Performance. This table reports regression coefficients from separate OLS regressions of firm performance measures on each entrepreneur characteristic. For Panels B and C, log revenue and log employment are used as dependent variables and regressions are conditional on survival. The sample includes all new firms in the SINE survey from 1994-2014. Standard errors clustered at industry level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

| **Panel A: Firm Survival** | | | |
|---|---|---|---|
| | Survival | | |
| | 3-Year | 5-Year | 7-Year |
| College Degree | .03*** | .039*** | .043*** |
| | (.0088) | (.013) | (.014) |
| Former Executive/CEO | .044*** | .039*** | .039*** |
| | (.0072) | (.011) | (.0096) |
| Serial Entrepreneur | .02*** | .0098* | .0053 |
| | (.0041) | (.0057) | (.0055) |
| Age of founder | .0017*** | .0016*** | .00087*** |
| | (.00021) | (.00028) | (.0003) |
| Industry FE | Yes | Yes | Yes |
| Cohort FE | Yes | Yes | Yes |
| adj. $R^2$ | .032 | .033 | .039 |
| Observations | 111,972 | 97,405 | 97,405 |

| **Panel B: Revenue** | | | | | | |
|---|---|---|---|---|---|---|
| | 3-Year | | 5-Year | | 7-Year | |
| | Log | Top 10% | Log | Top 10% | Log | Top 10% |
| College Degree | .15** | .2** | .21** | .055** | .074*** | .08*** |
| | (.066) | (.081) | (.083) | (.022) | (.028) | (.03) |
| Former Executive/CEO | .41*** | .45*** | .47*** | .11*** | .13*** | .14*** |
| | (.048) | (.062) | (.063) | (.019) | (.023) | (.025) |
| Serial Entrepreneur | .21*** | .24*** | .24*** | .06*** | .072*** | .079*** |
| | (.019) | (.021) | (.025) | (.0055) | (.0066) | (.0093) |
| Age of founder | .0014 | -.001 | -.0022 | .0011*** | .00084** | .00076 |
| | (.0012) | (.0015) | (.0018) | (.0003) | (.00037) | (.00047) |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Cohort FE | Yes | No | Yes | No | Yes | No |
| adj. $R^2$ | .11 | .12 | .12 | .065 | .074 | .078 |
| Observations | 81,624 | 57,570 | 46,816 | 84,257 | 59,404 | 48,248 |

| **Panel C: Employment** | | | | | | |
|---|---|---|---|---|---|---|
| | 3-Year | | 5-Year | | 7-Year | |
| | Log | Top 10% | Log | Top 10% | Log | Top 10% |
| College Degree | .16*** | .2*** | .21*** | .022*** | .049*** | .027* |
| | (.032) | (.029) | (.042) | (.007) | (.01) | (.015) |
| Former Executive/CEO | .35*** | .35*** | .4*** | .074*** | .11*** | .092*** |
| | (.024) | (.029) | (.03) | (.0094) | (.015) | (.014) |
| Serial Entrepreneur | .23*** | .22*** | .25*** | .058*** | .076*** | .058*** |
| | (.021) | (.021) | (.02) | (.0059) | (.0075) | (.0049) |
| Age of founder | .0047*** | .0029*** | .0042*** | .00072*** | .00077*** | .00023 |
| | (.00098) | (.00099) | (.0011) | (.00022) | (.00027) | (.00029) |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Cohort FE | Yes | No | Yes | No | Yes | No |
| adj. $R^2$ | .06 | .064 | .073 | .035 | .049 | .046 |
| Observations | 36,725 | 31,161 | 21,179 | 84,257 | 59,404 | 48,248 |

**Table A3: Sector-Level Changes in Business Formation and Concentration, 1994-2014.** Changes in market shares and entry rates are in percentage points. Changes in HHI are in levels. Industries are ranked by change in top 4 firm market share.

| Industry | Δ Superstar Market Share | | | Δ HHI | Δ Entry |
|---|---|---|---|---|---|
| | Top 4 | Top 8 | Top 20 | | Rate |
| Water, waste & remediation | 0.12 | 0.09 | 0.06 | 147 | 0.00 |
| Mining and quarrying | 0.07 | 0.08 | 0.07 | 93 | -0.03 |
| Trade & vehicle repair | 0.05 | 0.06 | 0.07 | 78 | -0.04 |
| Transport & storage | 0.04 | 0.04 | 0.03 | 365 | -0.01 |
| Manufacturing | 0.04 | 0.05 | 0.06 | 15 | -0.05 |
| Professional & scientific | 0.03 | 0.03 | 0.02 | 29 | 0.03 |
| Construction | -0.01 | -0.01 | -0.02 | 11 | -0.00 |
| Accommodation & food services | -0.01 | -0.01 | -0.01 | -44 | -0.03 |
| Electricity, gas & air supply | -0.04 | -0.03 | -0.03 | -2403 | 0.33 |
| Information & communication | -0.07 | -0.05 | -0.03 | -333 | 0.15 |

**Table A4:** Appendix Table: Five-Year Changes and Subsets of Years

| | Top 20 Index | Top 8 Index | Top 4 Index | Log HHI |
|---|---|---|---|---|
| **Panel A: Five-Year Changes** | | | | |
| Five-Year Changes | -1.3377*** | -1.1829*** | -1.1770*** | -0.1083*** |
| | (0.34387) | (0.36121) | (0.36081) | (0.03262) |
| **Panel B: Five-Year Changes Including New Firms** | | | | |
| Including New Firms | -0.9156*** | -0.7435** | -0.6445* | -0.0722** |
| | (0.28108) | (0.31717) | (0.35944) | (0.03130) |
| **Panel C: Subsets of Years** | | | | |
| 1994–2004 | -2.8441*** | -2.9214*** | -3.0712*** | -0.2244*** |
| | (0.28108) | (0.31717) | (0.35944) | (0.03130) |
| 2004–2014 | -2.6954*** | -2.3060*** | -2.2218*** | -0.1947*** |
| | (0.28108) | (0.31717) | (0.35944) | (0.03130) |

*Notes*: This table reports regression estimates of the relationship between industry concentration and firm creation, measured in five-year changes and across different time spans from 1994 to 2014. Columns correspond to four concentration measures: the Top 20 Index, the Top 8 Index, the Top 4 Index, and the log of the Herfindahl–Hirschman Index (HHI). **Panel A** displays results for five-year changes, while **Panel B** incorporates newly created firms into those five-year changes. **Panel C** examines the 1994–2004 and 2004–2014 periods separately. Standard errors are in parentheses. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

**Table A5:** Superstar Firm Productivity and Changes in Concentration

| | **Top 20 Index** | **Top 8 Index** | **Top 4 Index** | **Log HHI** |
|---|---|---|---|---|
| Productivity of Top 20 Firms | 2.06** | 2.17** | 2.27* | 0.17** |
| | (1.00) | (1.06) | (1.21) | (0.07) |
| Productivity of Top 8 Firms | 2.75** | 2.85** | 3.01** | 0.28*** |
| | (1.08) | (1.18) | (1.30) | (0.08) |
| Productivity of Top 4 Firms | 2.13** | 2.26** | 1.99* | 0.35*** |
| | (1.01) | (1.12) | (1.10) | (0.11) |

*Notes*: This table presents estimates of the relationship between industry concentration and the productivity of superstar firms. Productivity is measured as revenue per worker for firms ranked among the top 20, top 8, and top 4 in revenue within their industry. The columns represent different measures of industry concentration: the Top 20 Index, the Top 8 Index, the Top 4 Index, and the log of the Herfindahl-Hirschman Index (HHI). Each entry in the table reflects the regression coefficient of the concentration measure on the log of sales per employee for the specified group of top firms, controlling for other firm characteristics and industry fixed effects. Standard errors, reported in parentheses, are robust to heteroscedasticity. Significance levels are indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

**Table A6:** Regression Results Including Demographic Controls

| | **Top 20 Index** | **Top 8 Index** | **Top 4 Index** | **Log HHI** |
|---|---|---|---|---|
| Concentration Measure | -3.336*** | -3.098*** | -3.075*** | -0.238** |
| | (0.694) | (0.755) | (0.796) | (0.098) |
| Previously CEO | -0.080 | 0.117 | 0.399 | -0.075 |
| | (0.806) | (0.832) | (0.861) | (0.787) |
| Previously Working | -0.246 | -0.329 | -0.464 | 0.062 |
| | (0.712) | (0.731) | (0.735) | (0.724) |
| Has College | -0.075 | -0.015 | 0.080 | 0.292 |
| | (1.337) | (1.398) | (1.450) | (1.442) |
| No Bac | -0.870 | -0.726 | -0.565 | -0.548 |
| | (1.055) | (1.097) | (1.129) | (1.170) |
| Older Founder | -0.612 | -0.722 | -0.531 | -0.421 |
| | (1.248) | (1.321) | (1.316) | (1.254) |
| Log(Age) | 1.809 | 1.679 | 0.882 | 1.237 |
| | (2.733) | (2.860) | (2.830) | (2.714) |
| Franchise New | 0.586 | 0.465 | 0.471 | -0.089 |
| | (0.879) | (0.869) | (0.879) | (0.792) |
| Same Activity Before | 0.779* | 0.730 | 0.726 | 0.469 |
| | (0.454) | (0.471) | (0.482) | (0.545) |

*Notes*: This table presents regression estimates examining the impact of industry concentration on various demographic and professional characteristics of firm founders. Concentration is quantified by the Top 20 Index, Top 8 Index, Top 4 Index, and the logarithm of the Herfindahl-Hirschman Index (Log HHI). The dependent variables include previous CEO experience, prior working status, educational attainment (Has College, No Bac), age of founder (Older Founder, Log(Age)), and entrepreneurial background (Franchise New, Same Activity Before). The estimates control for additional demographic and firm-specific variables to isolate the effect of industry concentration on these founder characteristics. Standard errors, reported in parentheses beside the coefficients, are robust to heteroscedasticity. Significance levels are denoted as follows: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Each column represents a separate regression analysis, allowing for the examination of the influence of each concentration measure independently.

**Table A7:** United States New Firms and New Firm Employment Share by Concentration Growth

| | **Top 4 Index** | **Top 8 Index** | **Top 20 Index** | **Top 50 Index** |
|---|---|---|---|---|
| Change in Log New Startups | -0.02** | -0.02*** | -0.02*** | -0.03*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Change in New Firm Employment Share | -0.02 | -0.03* | -0.04** | -0.05** |
| | (0.02) | (0.02) | (0.02) | (0.02) |

*Notes*: This table reports regression estimates examining the relationship between changes in industry concentration and the rate of new firm creation across U.S. industries at the four-digit NAICS level from 2002 to 2017. The dependent variable is the long-difference change in the logarithm of new firm entries over the 15-year period. The key independent variables measure the corresponding changes in industry concentration, defined as the change in the revenue shares of the top 4, top 8, top 20, and top 50 firms within each industry. All regressions are weighted by industry size, and standard errors are robust to heteroscedasticity. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.