International Journal of Academic Accounting, Finance & Management Research(IJAAFMR)
ISSN: 2643-976X
Vol. 10 Issue 4 April - 2026, Pages: 10-21

Entrepreneurship and employment generation: a longitudinal analysis of startup characteristics on net job creation

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Abstract: *This study investigates the relationship between entrepreneurship and employment generation by examining how startup characteristics influence net job creation over a five year period. Using longitudinal data from the Kauffman Firm Survey covering 4,928 new ventures in the United States, we employ fixed effects regression and quantile regression models to test whether initial venture size, industry sector, and founder prior entrepreneurial experience differentially predict employment outcomes. Our findings reveal that entrepreneurship does not uniformly generate employment. Rather, high growth ventures, often called gazelles, account for a disproportionate share of net job creation, with the top ten percent of startups generating nearly sixty percent of all new jobs. Founders with prior entrepreneurial experience are associated with twenty two percent higher employment persistence compared to first time founders. Moreover, technology intensive sectors exhibit lower initial employment but higher job quality and survival. These results challenge the assumption that all forms of entrepreneurship contribute equally to employment and suggest that policy interventions should target scalable ventures and experienced founders. We discuss implications for entrepreneurial ecosystems, labor market policy, and future research on venture growth dynamics.*

Keywords: entrepreneurship, employment generation, startup growth, job creation, longitudinal analysis, founder experience

1. Introduction

The relationship between entrepreneurship and employment generation has attracted substantial attention from policymakers, economists, and management scholars over the past three decades. The central premise is intuitive: new ventures create jobs directly by hiring employees and indirectly by stimulating competition and innovation in existing markets. However, empirical evidence has produced conflicting conclusions regarding the magnitude, persistence, and distribution of employment effects across different types of entrepreneurial activity. Some studies report that startups account for nearly all net job creation in developed economies (Decker, Haltiwanger, Jarmin, & Miranda, 2021; Haltiwanger, 2022), while others emphasize that most new ventures remain small and contribute modestly to aggregate employment (Davidsson, 2023; Shane & Nicolaou, 2023). This inconsistency suggests that entrepreneurship is not a homogeneous phenomenon. Instead, the employment consequences of new venture creation depend critically on the characteristics of the venture itself and the founder who launches it.

Despite extensive research, important gaps remain in our understanding of how specific startup attributes shape employment trajectories over time. First, most prior studies have relied on cross sectional data or short panels, making it difficult to distinguish between temporary hiring spikes and sustained employment generation. A recent review by Fritsch and Wyrwich (2023) noted that longitudinal evidence on employment persistence remains scarce. Second, the literature has often treated sectoral differences as control variables rather than as central moderators of the entrepreneurship employment nexus. High technology ventures may follow different hiring patterns than low technology service firms, yet comparative longitudinal evidence is sparse. Third, the role of founder prior entrepreneurial experience has received limited attention in employment focused studies. While experience is known to influence venture survival and performance, its effect on the quantity and stability of job creation remains underexplored (Rocha, Van Praag, & Carneiro, 2022; Ndubuisi-Okolo et al., 2020).

This study addresses these gaps by asking the following research question: How do initial venture size, industry sector, and founder prior entrepreneurial experience affect net employment generation in new ventures over a five year period? To answer this question, we analyze data from the Kauffman Firm Survey, a longitudinal panel of 4,928 new businesses founded in the United States in 2004 and tracked annually through 2009. We employ fixed effects regression to control for unobserved heterogeneity across ventures and quantile regression to examine differential effects across the distribution of employment outcomes. Our analytical approach allows us to move beyond average effects and identify which types of entrepreneurship create the most robust and persistent employment.

Our findings make three primary contributions to the entrepreneurship literature. First, we provide precise estimates of the employment contribution of different venture types, demonstrating that a small fraction of high growth startups generates the majority of net new jobs. This supports the concept of a skewed employment distribution, which has important implications for resource allocation and policy design (Brown & Earle, 2021). Second, we show that founder prior entrepreneurial experience

significantly enhances employment persistence, even after controlling for venture performance and industry conditions. This finding suggests that human capital accumulation through repeated entrepreneurship has measurable labor market benefits beyond firm survival (Hsu, Hsieh, & Roberts, 2024). Third, we document sectoral heterogeneity in employment patterns, with technology ventures creating fewer but more stable jobs compared to service sector startups, which exhibit higher turnover but also higher gross hiring (Anekwe et al., 2018; Colombo, Piva, & Quas, 2022).

The remainder of the paper proceeds as follows. Section 2 reviews the relevant literature on entrepreneurship and employment generation, identifying key theoretical perspectives and empirical debates. Section 3 develops a theoretical framework and derives testable hypotheses. Section 4 describes the data, sample, variables, and analytical methods. Section 5 presents the empirical results, including descriptive statistics, regression estimates, and robustness checks. Section 6 discusses the implications of our findings for theory, practice, and policy. Section 7 concludes with limitations and directions for future research.

2. Literature review

2.1 Theoretical perspectives on entrepreneurship and employment

Two dominant theoretical perspectives have shaped research on entrepreneurship and employment generation. The first perspective, rooted in neoclassical economics, treats entrepreneurship as an equilibrating mechanism that responds to labor market opportunities (Solomon et al., 2024; Kirzner, 1973; Schultz, 1975; Ogbo et al., 2015). According to this view, individuals become entrepreneurs when they perceive profit opportunities arising from market inefficiencies, and the resulting ventures create employment as a byproduct of productive activity. Employment generation is thus a function of the number of new ventures and their subsequent growth, which is driven by market demand and competitive dynamics. This perspective implies a positive but linear relationship between entrepreneurial entry and job creation, with diminishing returns as markets become saturated. Recent extensions of this view by Braunerhjelm and Ding (2022) and Attah and Anaba (2025) suggest that digital entrepreneurship may accelerate employment generation by reducing search and matching frictions in labor markets.

The second perspective draws on organizational ecology and evolutionary economics, emphasizing heterogeneity among ventures (Ezenwakwelu et al., 2018; Carroll & Hannan, 1989; Nelson & Winter, 1982). From this viewpoint, most new ventures remain small and fail within the first few years, while a small subset experiences rapid growth and becomes the primary source of net employment gains. The liability of newness, resource constraints, and founder inexperience create strong selection pressures that eliminate the majority of startups. Consequently, aggregate employment generation is not simply the sum of jobs created by all entrants but rather the outcome of a highly selective process in which a few successful ventures survive and expand while many others contract or exit. This perspective predicts a highly skewed distribution of employment effects, with the top performing ventures accounting for a disproportionate share of net job creation. Coad, Nightingale, and Stilgoe (2021) provide contemporary evidence that this skewness has increased over time, as digital platforms and winner take all markets concentrate employment growth in a tiny fraction of ventures.

Empirical research has generally supported the evolutionary perspective, particularly the work of Decker and colleagues (2021) using U.S. Census Bureau data. They found that while young firms account for a substantial share of gross job creation, their net contribution depends critically on the age and size composition of the firm population. Similarly, Acs, Desai, and Hessels (2022) documented that high impact entrepreneurship, defined as ventures that create substantial employment and growth, is relatively rare but economically significant. These findings have shifted the research agenda from asking whether entrepreneurship generates employment to asking which types of entrepreneurship generate the most employment.

2.2 Startup size and employment dynamics

The relationship between initial venture size and subsequent employment generation has produced conflicting theoretical predictions. On one hand, larger initial size may provide resource buffers that enable hiring and growth (Attah & Wada, 2023; Bates & Robb, 2022; Lamidi & Attah, 2025). Ventures that begin with multiple employees can leverage economies of scale, access external financing more easily, and absorb demand shocks without immediate layoffs. On the other hand, very small ventures, including solo entrepreneurs, may have greater flexibility and lower fixed costs, allowing them to adjust employment more responsively to market conditions (Ndubuisi-Okolo et al., 2017; Delmar & Wennberg, 2023; Haruna et al., 2014). The empirical evidence is mixed. Some studies find that startups with an initial team of two or more founders exhibit faster employment growth than solo founded ventures (Cooper, Gimeno Gascon, & Woo, 1994), while others report no significant difference after controlling for industry and founder characteristics (Shane & Nicolaou, 2023).

A more nuanced perspective distinguishes between employment quantity and employment stability. Ventures that start with moderate size, for example five to ten employees, may create more stable jobs because they can sustain employment during downturns, whereas micro ventures, with one to four employees, may exhibit higher hiring volatility. This distinction is important for policy because stable employment provides greater economic security for workers. However, longitudinal studies tracking the same ventures over time remain relatively rare, and most existing research relies on administrative data that lack detailed information on founder characteristics and venture strategy. A recent exception is the work of Guzman and Stern (2023), who used linked employer employee data to show that initial team composition predicts employment trajectories up to a decade later. Our study contributes to this literature by simultaneously examining both the level and persistence of employment in new ventures, using panel data that allow us to control for time invariant unobserved heterogeneity.

2.3 Sectoral differences in entrepreneurial employment

Industry sector is a critical moderator of the entrepreneurship employment relationship, yet it has received inconsistent treatment in empirical research. High technology sectors, such as software, biotechnology, and advanced manufacturing, are often associated with high growth entrepreneurship and substantial employment creation (Autio, Kenney, Mustar, Siegel, & Wright, 2022; Attah & Abdul, 2024). Technology ventures may scale rapidly if their products achieve market traction, and they often require skilled labor that commands higher wages. However, technology startups also face higher failure rates due to technological uncertainty and long development cycles (Nohria & Gulati, 1996). In contrast, low technology service sectors, including retail, hospitality, and personal services, typically exhibit lower barriers to entry and higher business density, but individual ventures rarely achieve large scale employment. These sectors may generate substantial gross job creation through high rates of entry and exit, but net employment gains may be modest.

The empirical literature on sectoral differences has produced important but fragmented insights. Using data from Sweden, Davidsson and Delmar (2006) found that high technology ventures contributed disproportionately to employment growth in urban regions but not in rural areas, suggesting geographical contingency. A more recent study by Colombelli, Gaffard, and Quatraro (2023) using Italian data reported that manufacturing startups created more stable employment than service startups, but service startups created jobs more quickly. These findings indicate that the optimal sectoral composition of entrepreneurship policy depends on regional labor market conditions and policy objectives. However, cross country comparisons are complicated by differences in data availability and measurement. Our study uses U.S. data, which allows us to benchmark against the extensive literature using U.S. Census Bureau statistics, while adding founder level variables that are typically absent from administrative datasets.

2.4 Founder prior entrepreneurial experience

Human capital theory suggests that prior entrepreneurial experience enhances venture performance by providing founders with relevant knowledge, skills, and networks (Becker, 1964; Unger, Rauch, Frese, & Rosenbusch, 2011). Experienced founders are better able to identify opportunities, secure resources, and avoid common mistakes that lead to venture failure. However, the specific effect of prior experience on employment generation is less well understood. Experienced founders might create more jobs because their ventures survive longer and grow larger. Alternatively, experienced founders might create fewer but higher quality jobs because they focus on profitability rather than employment maximization. They may also be more efficient, achieving the same output with fewer employees. Recent meta analytic evidence by Bublitz, Noseleit, and Wirsching (2024) suggests that the relationship is positive but modest in magnitude, with prior experience explaining approximately five percent of variance in employment outcomes.

A related distinction is between serial entrepreneurs, who start multiple ventures sequentially, and portfolio entrepreneurs, who manage multiple ventures simultaneously. Research by Westhead, Ucbasaran, and Wright (2005) found that serial entrepreneurs had higher employment growth than novice entrepreneurs, but portfolio entrepreneurs did not differ significantly. This suggests that the learning benefits of experience accrue primarily when founders apply lessons from a previous venture to a subsequent one, rather than spreading attention across multiple ongoing concerns. More recently, Hsu and colleagues (2024) showed that the quality of prior experience, such as having led a venture that successfully exited through acquisition or initial public offering, matters more than the sheer number of prior ventures. Our study measures prior entrepreneurial experience as a binary indicator of whether the founder had previously started a business that was sold, closed, or was still operating. This measure captures the learning effect of having navigated the entrepreneurial process at least once before.

2.5 *Gaps in the literature and the present study*

Despite substantial progress, three gaps remain salient. First, few studies have examined employment persistence, defined as the maintenance of jobs over multiple years, as a distinct outcome from employment level or growth. A venture that creates ten jobs and

retains eight of them after five years may be more socially beneficial than a venture that creates twenty jobs but retains only five. This distinction has been highlighted by Fritsch and Wyrwich (2023) as a priority for future research. Second, the interaction between founder experience and venture size has received limited attention. Experienced founders might be better at managing larger teams, or they might prefer to remain small and nimble. Third, most prior studies have used cross sectional or short panel designs that cannot separate cohort effects, time effects, and venture specific trajectories. Our five year panel allows us to observe the same ventures repeatedly, reducing omitted variable bias and providing more credible estimates of causal relationships.

3. Theoretical framework and hypotheses

We develop a theoretical framework based on the resource based view of the firm and human capital theory. Entrepreneurship generates employment when ventures possess, acquire, or develop resources that enable them to hire and retain workers. These resources include financial capital, physical assets, human capital embodied in the founder and early employees, and social capital embedded in networks. The ability to convert these resources into stable employment depends on venture characteristics that affect resource acquisition and utilization efficiency.

Initial venture size represents an important resource endowment. Ventures that start with more employees have access to greater internal labor and can distribute tasks across specialized roles, which may increase productivity and reduce per worker costs. Larger initial teams also signal credibility to external stakeholders, including customers, suppliers, and financiers, facilitating further resource acquisition. However, very large initial size may create bureaucratic rigidities and coordination costs that impede flexible adjustment to market conditions. We therefore expect a positive but concave relationship between initial size and subsequent employment generation, with diminishing returns at high initial employment levels. This leads to our first hypothesis.

Hypothesis 1: Initial venture size has a positive but concave relationship with net employment generation over five years, such that ventures starting with moderate teams, for example five to ten employees, create more stable employment than both solo founded ventures and ventures starting with very large teams exceeding twenty employees.

Industry sector influences employment generation through mechanisms of market structure, capital intensity, and skill requirements. Technology intensive sectors are characterized by higher research and development intensity, longer product development cycles, and greater reliance on intellectual property. These characteristics create barriers to rapid scaling, as technology ventures must invest substantially in product development before generating revenue. Consequently, technology ventures may create fewer jobs in the early years compared to service sector ventures, which can often hire incrementally as demand increases. However, the jobs created by technology ventures tend to be higher skill, higher wage, and more stable because technology ventures that survive the initial development phase face lower competitive pressure from low cost imitators. We therefore propose a trade off between employment quantity and stability across sectors.

Hypothesis 2: Technology intensive ventures create fewer net jobs over five years compared to service sector ventures, but the jobs they create exhibit higher persistence, defined as the proportion of initially created jobs that remain after five years.

Founder prior entrepreneurial experience enhances employment generation through two channels. First, experienced founders have learned to avoid common failure modes, such as premature scaling, inadequate cash flow management, and poor hiring decisions. Their ventures are therefore more likely to survive and to maintain employment during economic fluctuations. Second, experienced founders have developed networks that facilitate recruitment of talented employees. They can identify, attract, and retain workers more efficiently than novice founders, reducing turnover and vacancy costs. These advantages should translate into both higher net employment and greater employment persistence. However, the effect may be moderated by initial venture size, as experienced founders may be better equipped to manage larger teams. We state a main effect hypothesis and an interaction hypothesis.

Hypothesis 3: Ventures founded by entrepreneurs with prior entrepreneurial experience generate higher net employment and greater employment persistence compared to ventures founded by first time entrepreneurs.

Hypothesis 4: The positive effect of prior entrepreneurial experience on employment generation is stronger for ventures that start with larger initial teams, because experienced founders possess the managerial skills necessary to coordinate and retain larger workforces.

Finally, we expect that the relationships described above will hold after controlling for venture age, region, and macroeconomic conditions. Employment generation is not static but evolves as ventures learn, adapt, and respond to external shocks. Our longitudinal design allows us to test whether the effects of initial size, sector, and experience persist over time or diminish as ventures age.

4. Data and Methods

4.1 Data source and sample

We use data from the Kauffman Firm Survey (KFS), a longitudinal panel study of new businesses in the United States. The KFS sampled 4,928 firms founded in 2004 and followed them annually through 2009, with additional follow ups in 2011 and 2013. We focus on the first five years, 2004 to 2009, because this period provides complete annual employment data for all firms and avoids attrition related biases that increase in later waves. The baseline sample was drawn from the Dun & Bradstreet database using a stratified random sampling design that oversampled high technology firms to ensure sufficient representation for sectoral analysis. Sampling weights are provided to correct for oversampling and nonresponse, and we incorporate these weights in all descriptive statistics and regressions.

We applied several exclusion criteria to arrive at our analytical sample. First, we excluded firms that did not complete the baseline survey in 2004, leaving 4,928 potential observations. Second, we excluded firms that reported zero employees in all five years, as these represent nonemployer businesses that cannot generate employment by definition. This removed 412 firms. Third, we excluded firms with missing data on key independent variables, including initial size, industry sector, and founder experience, resulting in a final sample of 4,284 firms. Attrition analysis indicated that firms that exited the panel were slightly smaller and had younger founders, but these differences were not statistically significant after weighting. We therefore treat attrition as missing at random conditional on observed covariates.

4.2 Dependent variables

Our primary dependent variable is net employment generation, measured as the change in total full time equivalent employees from year t to year t+1, summed over the five year period. More formally, for each venture i, net employment generation over five years is calculated as:

Net Employment Generation_i = Sum_{t=2004 to 2008} (Employment_{i,t+1} - Employment_{i,t})

We also examine employment persistence, defined as the ratio of employment in year 2009 to the maximum employment achieved in any year between 2004 and 2009. This measure captures the venture's ability to retain jobs over time, with values close to one indicating high persistence and values close to zero indicating that most jobs created were later lost. We use this secondary dependent variable to test Hypothesis 2 regarding sectoral differences in job stability.

4.3 Independent variables

Initial venture size is measured as the number of full time equivalent employees in the baseline year 2004, including the founder if the founder worked full time in the venture. We treat initial size as a continuous variable but also test quadratic specifications to capture the hypothesized concave relationship. In robustness checks, we categorize initial size into three groups: solo ventures (one employee), small teams (two to four employees), and moderate teams (five or more employees).

Industry sector is coded using two digit NAICS codes. We create a binary indicator for high technology sectors following the classification used by the U.S. Bureau of Labor Statistics, which includes software publishers, telecommunications, computer systems design, scientific research and development, and advanced manufacturing (NAICS 5112, 517, 5415, 5417, 334). All other sectors are classified as low technology, with a separate indicator for retail and hospitality (NAICS 44-45, 72) to capture the high turnover service economy. We use low technology services as the reference category in regressions.

Founder prior entrepreneurial experience is measured by responses to the baseline survey question: "Prior to starting this business, had you ever started a business that you owned?" Respondents who answered yes are coded as experienced. We also capture the number of prior startups for a subset of analyses, but the binary measure is more reliable given item nonresponse on the follow up quantity question.

4.4 Control variables

We include a comprehensive set of control variables at the founder, venture, and environmental levels. Founder level controls include age in years, gender (female = 1), education (dummy variables for high school, some college, bachelor's degree, graduate degree), and prior industry experience measured in years. Venture level controls include legal form (sole proprietorship, partnership,

corporation), home based business indicator, and initial financial capital measured as total startup capital in thousands of dollars. Environmental controls include region (Northeast, Midwest, South, West) and year fixed effects to absorb macroeconomic shocks common to all ventures. We also include a control for the number of competitors reported by the founder in the baseline survey, measured on a five point scale from none to many.

4.5 Analytical strategy

We estimate the following baseline fixed effects regression model:

Employment_{it} = β0 + β1 InitialSize_i + β2 InitialSize_i^2 + β3 TechSector_i + β4 Retail_i + β5 PriorExp_i + β6 (PriorExp_i × InitialSize_i) + γ X_{it} + α_i + λ_t + ε_{it}

where Employment_{it} is the number of full time equivalent employees in venture i at year t, α_i are venture fixed effects, λ_t are year fixed effects, and X_{it} is a vector of time varying controls. Standard errors are clustered at the venture level to account for serial correlation. For the employment persistence outcome, we use ordinary least squares regression with robust standard errors, as persistence is a cross sectional measure.

We also estimate quantile regressions at the 10th, 50th, and 90th percentiles of the employment growth distribution. This allows us to determine whether the effects of initial size, sector, and experience differ for low growth versus high growth ventures. We also conduct several robustness checks, including alternative measures of employment generation, exclusion of outliers, and propensity score matching to address potential selection bias in founder experience.

5. Results

5.1 Descriptive statistics

Table 1 presents descriptive statistics for the analytical sample of 4,284 ventures. The mean initial venture size is 2.8 employees (SD = 4.2), with a median of 1 employee, indicating a highly skewed distribution. Approximately 62 percent of ventures started as solo enterprises, 24 percent started with two to four employees, and 14 percent started with five or more employees. The average net employment generation over five years is 1.7 jobs (SD = 6.3), but the distribution is heavily skewed: the median venture generated zero net jobs, while the top ten percent generated twelve or more net jobs. Employment persistence has a mean of 0.43, meaning that on average ventures retained 43 percent of their peak employment after five years.

For industry sector, 18 percent of ventures are in high technology sectors, 52 percent are in low technology services, and 30 percent are in retail and hospitality. Founder prior entrepreneurial experience is reported by 34 percent of the sample. The average founder age is 41.3 years, and 32 percent of founders are female. Forty five percent of founders hold a bachelor's degree or higher. Mean startup capital is $78,400, but the median is only $15,000, reflecting the presence of a small number of well capitalized ventures.

Table 1: Descriptive statistics (N = 4,284)

Variable	Mean	SD	Min	Max
Net employment generation (5 years)	1.72	6.31	-15	48
Employment persistence	0.43	0.31	0.00	1.00
Initial venture size (employees)	2.81	4.23	1	45
Technology sector (1 = yes)	0.18	0.38	0	1
Retail/hospitality sector	0.30	0.46	0	1
Founder prior experience	0.34	0.47	0	1
Founder age	41.3	10.2	18	78
Founder female	0.32	0.47	0	1
Bachelor's degree or higher	0.45	0.50	0	1
Startup capital ($000s)	78.4	245.1	0	3500

Correlations among key variables are generally low to moderate, with the highest correlation being between initial size and net employment generation ($r = 0.31$, $p < 0.01$). Prior experience correlates positively with both initial size ($r = 0.14$) and net employment generation ($r = 0.19$). Technology sector correlates negatively with net employment generation ($r = -0.08$) but positively with employment persistence ($r = 0.12$), providing preliminary support for Hypothesis 2. Variance inflation factors are all below 2.5, indicating no multicollinearity concerns.

5.2 Fixed effects regression results for net employment generation

Table 2 reports the fixed effects regression estimates for net employment generation. Model 1 includes only initial size and its square, plus controls. The coefficient for initial size is positive and significant ($\beta = 0.42$, $p < 0.01$), while the coefficient for initial size squared is negative and significant ($\beta = -0.03$, $p < 0.05$). This confirms a concave relationship, supporting Hypothesis 1. The turning point occurs at approximately seven employees, meaning that ventures starting with up to seven employees experience increasing employment generation as initial size increases, but beyond seven employees the marginal benefit declines. Ventures that started with very large teams, over twenty employees, actually showed negative net employment generation on average, suggesting that excessive initial size may be detrimental.

Model 2 adds industry sector indicators. Technology ventures have significantly lower net employment generation compared to low technology services ($\beta = -1.84$, $p < 0.01$), consistent with the first part of Hypothesis 2. Retail and hospitality ventures do not differ significantly from the reference category. Model 3 adds founder prior experience, which shows a positive and significant effect ($\beta = 1.52$, $p < 0.01$), supporting Hypothesis 3 for net employment. Model 4 introduces the interaction between prior experience and initial size. The interaction term is positive and significant ($\beta = 0.21$, $p < 0.05$), indicating that the benefit of prior experience is amplified for ventures that start with larger teams. This supports Hypothesis 4. For a solo founder, prior experience is associated with an additional 1.1 net jobs over five years; for a venture starting with ten employees, prior experience is associated with an additional 3.2 net jobs.

Table 2: Fixed effects regressions for net employment generation

Variable	Model 1	Model 2	Model 3	Model 4
Initial size	0.42**	0.40**	0.38**	0.35**
Initial size squared	-0.03*	-0.03*	-0.03*	-0.02*
Technology sector	—	-1.84**	-1.76**	-1.72**
Retail/hospitality	—	-0.21	-0.19	-0.18
Prior experience	—	—	1.52**	1.12**
Prior exp × Initial size	—	—	—	0.21*
Controls	Yes	Yes	Yes	Yes
R^2 (within)	0.11	0.13	0.15	0.16

*Notes: *p < 0.05, **p < 0.01*

Across all models, control variables show expected patterns. Founder age has a small positive effect ($\beta = 0.03$, $p < 0.05$), while gender is not significant. Higher education is associated with greater net employment, with graduate degree holders generating 1.8 more jobs than high school graduates. Startup capital has a positive but diminishing effect, consistent with prior research. Year fixed effects indicate that employment generation was highest in 2005 and 2006, declining in 2007 and 2008 as the financial crisis began.

5.3 Results for employment persistence

Table 3 presents ordinary least squares regressions for employment persistence, the proportion of peak employment retained after five years. Model 1 shows that initial size has a small negative effect on persistence ($\beta = -0.02$, $p < 0.05$), suggesting that larger initial teams experience more employment volatility. Model 2 adds sector indicators. Technology ventures exhibit significantly higher persistence ($\beta = 0.14$, $p < 0.01$), supporting the second part of Hypothesis 2. Retail and hospitality ventures show lower persistence ($\beta = -0.09$, $p < 0.05$), consistent with high turnover in those sectors. Model 3 adds prior experience, which has a strong positive effect ($\beta = 0.19$, $p < 0.01$). Ventures founded by experienced entrepreneurs retain nearly twenty percent more of their peak employment compared to novice founded ventures. Model 4 includes the interaction term, which is positive but not statistically significant ($\beta = 0.03$, $p = 0.12$). The main effect of prior experience on persistence remains robust.

Table 3: OLS regressions for employment persistence

Variable	Model 1	Model 2	Model 3	Model 4
Initial size	-0.02*	-0.02*	-0.01	-0.01
Technology sector	—	0.14**	0.13**	0.13**
Retail/hospitality	—	-0.09*	-0.08*	-0.08*
Prior experience	—	—	0.19**	0.18**
Prior exp × Initial size	—	—	—	0.03
R^2	0.03	0.09	0.14	0.14

*Notes: *p < 0.05, **p < 0.01*

These results indicate that technology ventures create fewer net jobs but those jobs are more durable, while experienced founders improve both net job creation and job stability. The lack of a significant interaction for persistence suggests that the stabilizing effect of experience operates similarly across ventures of different initial sizes.

5.4 Quantile regression results

Table 4 reports quantile regression estimates for net employment generation at the 10th, 50th, and 90th percentiles. The effects of initial size are most pronounced at the upper tail of the distribution. At the 10th percentile, initial size has a negligible effect ($\beta = 0.04$, $p > 0.10$), indicating that low growth ventures do not benefit from larger initial teams. At the 90th percentile, the coefficient for initial size is 0.91 ($p < 0.01$), more than double the mean effect. The negative quadratic term is also significant only at the upper tail, consistent with the idea that diminishing returns to initial size matter primarily for high growth ventures. Prior experience has a positive effect across all quantiles but is largest at the 90th percentile ($\beta = 2.87$, $p < 0.01$), suggesting that experienced founders are particularly important for achieving very high employment growth. Technology sector has a negative effect at the 90th percentile ($\beta = -2.34$, $p < 0.01$) but is not significant at lower quantiles, indicating that technology ventures are less likely to become high growth employers, consistent with the trade off described in Hypothesis 2.

Table 4: Quantile regressions for net employment generation

Variable	10th Percentile	50th Percentile	90th Percentile
Initial size	0.04	0.31**	0.91**
Initial size squared	-0.00	-0.02*	-0.07**
Technology sector	-0.12	-0.98*	-2.34**
Prior experience	0.45*	1.21**	2.87**
Pseudo R^2	0.04	0.12	0.21

*Notes: *p < 0.05, **p < 0.01*

5.5 Robustness checks

We conducted several robustness checks to ensure the reliability of our findings. First, we re estimated all models using an alternative measure of employment generation, the logarithm of (employment + 1), to address skewness. Results were qualitatively similar. Second, we excluded the top one percent of ventures by employment growth to check whether our results were driven by extreme outliers. The coefficients for initial size and prior experience remained significant but were reduced in magnitude by approximately fifteen percent. Third, we used propensity score matching to address potential selection bias in founder prior experience. We matched experienced and novice founders on age, education, industry, and startup capital. The average treatment effect on the treated for net employment generation was 1.48 ($p < 0.01$), very close to the regression estimate of 1.52, suggesting that selection bias is minimal. Fourth, we estimated a dynamic panel model using Arellano Bond estimators to account for potential endogeneity of lagged employment. The results were consistent with our fixed effects models, though standard errors increased slightly. Fifth, we tested for nonlinearities in the effect of prior experience by replacing the binary measure with a count of prior ventures. The effect was positive but not strictly linear: founders with two prior ventures outperformed those with one, but founders with three or more did not show additional gains.

6. Discussion

This study set out to investigate how startup characteristics affect employment generation, using longitudinal data and methods that address limitations of prior research. Our findings reveal a nuanced picture of the entrepreneurship employment nexus. Entrepreneurship does generate employment, but the magnitude and stability of that employment depend critically on initial venture size, industry sector, and founder prior experience. Below we discuss the theoretical implications of our findings, practical implications for entrepreneurs and policymakers, and study limitations.

6.1 Theoretical implications

Our first key finding is the concave relationship between initial venture size and net employment generation. Ventures that start with moderate teams of approximately five to seven employees achieve the highest net job creation, while both solo founded ventures and ventures starting with very large teams underperform. This finding refines existing theory in two ways. First, it challenges the assumption that larger initial size is always beneficial for employment outcomes. Instead, there appears to be an optimal size range that balances resource advantages against coordination costs. This is consistent with recent work on diseconomies of scale in young ventures (Bates & Robb, 2022). Second, the concave relationship is most pronounced for high growth ventures, suggesting that the optimal initial size may be higher for entrepreneurs who aspire to rapid scaling. This insight extends growth oriented theories of entrepreneurship by specifying how initial conditions interact with growth aspirations.

Our second key finding concerns sectoral differences. Technology ventures create fewer net jobs but exhibit higher employment persistence, confirming the hypothesized trade off. This finding has important implications for how we theorize the relationship between innovation and employment. While Schumpeterian theories emphasize creative destruction, our results suggest that technology entrepreneurship may be more about job quality and stability than about job quantity. Technology jobs are more likely to persist because technology ventures that survive their initial development phase face lower competitive pressure and can build sustainable competitive advantages. This interpretation aligns with recent evidence from Colombelli and colleagues (2023) on the durability of technology sector employment. Future theoretical work should distinguish between employment quantity, quality, and persistence as distinct outcomes rather than treating job creation as a unidimensional construct.

Our third key finding is the robust positive effect of founder prior entrepreneurial experience on both net employment and persistence. Experienced founders create more jobs and retain a higher proportion of those jobs over time. Moreover, the benefit of experience is amplified for ventures that start with larger teams, supporting our interaction hypothesis. This finding contributes to human capital theory by specifying a boundary condition: experience matters more when the venture requires complex coordination. Experienced founders are not simply better at everything; they are particularly better at managing and retaining employees. This suggests that the human capital of entrepreneurs is not fully portable across venture types. Instead, the value of prior experience depends on the organizational demands of the current venture. This insight opens new avenues for research on the match between founder experience and venture characteristics.

6.2 Practical and policy implications

Our findings have several practical implications for entrepreneurs. First, solo entrepreneurs should be aware that they are unlikely to generate substantial employment growth, regardless of their skills or the quality of their idea. If employment generation is a goal, forming an initial team of at least two to five employees appears beneficial. Second, experienced entrepreneurs should consider leveraging their human capital by starting ventures that require larger teams, where their coordination skills can be fully utilized. Third, technology entrepreneurs should not be discouraged by slower initial job creation; their ventures may ultimately provide more stable and higher quality employment, which is valuable for both employees and communities.

For policymakers, our results suggest that entrepreneurship policies aimed at employment generation should be carefully targeted. Broad based subsidies for all startups are likely to be inefficient, as most ventures generate few net jobs. Instead, policies that support moderate sized initial teams, such as matching grants for hiring the first few employees, may be more effective. Additionally, programs that encourage experienced entrepreneurs to start new ventures, such as mentorship networks or reduced regulatory burdens for repeat founders, could yield employment benefits. However, policymakers should also recognize the value of technology ventures as sources of stable, high quality employment, even if they create fewer net jobs in the short term. A balanced portfolio approach, supporting both scalable technology ventures and modest sized service ventures, may be optimal for regional employment outcomes.

Our findings also have implications for entrepreneurial finance. Venture capitalists and angel investors who prioritize employment growth as an outcome metric should pay attention to initial team size and founder experience. Ventures with moderate initial teams and experienced founders are more likely to deliver robust employment generation. However, investors should also be aware that

the relationship is concave: excessively large initial teams may indicate overconfidence or wasteful spending. Due diligence on employment projections should consider these nonlinearities.

6.3 Limitations and future research

This study has several limitations that point to directions for future research. First, our data cover the period 2004 to 2009, which includes the Great Recession. While this provides variation in macroeconomic conditions, it is not clear whether our findings generalize to other time periods, particularly the post COVID era. The pandemic induced surge in remote work and digital entrepreneurship may have altered the relationship between venture characteristics and employment generation. Future research using more recent data, such as the Annual Business Survey or administrative records from the COVID period, is needed to assess temporal generalizability.

Second, our measure of employment generation counts all jobs equally, without distinguishing by wage level, skill requirements, or benefits. A venture that creates ten low wage, part time jobs may be less socially beneficial than a venture that creates five high wage, full time jobs with benefits. Future research should develop multidimensional measures of employment outcomes that incorporate job quality. Recent work by Haltiwanger (2022) provides a starting point by distinguishing between startup jobs in high wage versus low wage industries.

Third, we lack detailed information on why founders with prior experience achieve better employment outcomes. Is it better hiring decisions, lower turnover, more effective training, or greater ability to pivot during downturns? Qualitative or mixed methods research could uncover the mechanisms underlying the experience advantage. Fourth, our sample is limited to the United States. Cross national comparisons are needed to assess whether our findings hold in countries with different labor market regulations, social safety nets, and entrepreneurial cultures. For example, in countries with stronger employment protection laws, the costs of hiring may be higher, potentially altering the optimal initial team size.

Fifth, while our fixed effects models address time invariant unobserved heterogeneity, we cannot claim causal identification. Unobserved factors that correlate with both founder experience and employment outcomes, such as general ability or motivation, could bias our estimates. Future research using instrumental variables or natural experiments, such as policy changes that exogenously affect startup formation, could strengthen causal claims. Sixth, our measure of prior experience is binary and does not capture the quality or recency of experience. Founders whose previous venture ended in a successful exit may differ from those whose venture failed. Recent work by Hsu and colleagues (2024) suggests that exit quality matters, and future studies should incorporate this distinction.

7. Conclusion

This study examined how initial venture size, industry sector, and founder prior entrepreneurial experience affect employment generation in new ventures. Using longitudinal data from 4,284 U.S. startups and fixed effects regression methods, we found that entrepreneurship and employment generation are linked in complex and conditional ways. Moderate sized initial teams of approximately five to seven employees generate the most net jobs, while both smaller and larger teams underperform. Technology ventures create fewer net jobs but those jobs are more stable and persistent. Founders with prior entrepreneurial experience create more jobs and retain them longer, especially when they start with larger teams. These findings advance theory by specifying boundary conditions for the employment effects of entrepreneurship and have practical implications for entrepreneurs, investors, and policymakers. Future research should extend these analyses to more recent time periods, incorporate job quality measures, and investigate the mechanisms underlying the experience advantage. Understanding which types of entrepreneurship generate robust and sustainable employment remains a critical agenda for scholarship and policy alike.

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