

# Credit Expansion and the Scale of Entrepreneurship: The role of Heterogeneous Preferences for Leisure

Amatus Saleha Jafri

McMaster University

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## Abstract

I document that entrepreneurial hours are highly dispersed, and that entrepreneurs who work fewer hours operate smaller and less capitalized businesses. I extend the standard entrepreneur-worker occupational choice model with collateral constraints to include heterogeneous preferences for leisure and complementarity between entrepreneurial hours and hired labor. The model reproduces observed correlation between hours, entrepreneurial size, and assets, and reveals that the welfare impact of credit expansion depends on how entrepreneurs value leisure. Ignoring heterogeneity in leisure preferences overstates average welfare gains by more than 20 percent.

**Keywords:** Heterogeneous agents, entrepreneurs, preferences, constraint, hours

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†McMaster University. E-mail: [jafria6@mcmaster.ca](mailto:jafria6@mcmaster.ca).

# 1 Introduction

Entrepreneurs play a central role in wealth accumulation and economic activity. Canonical models of entrepreneurship emphasize differences in productivity and access to external finance. Much of the literature focuses on entrepreneurs at the upper end of the size distribution and attributes concentration in wealth and entrepreneurial scale to high productivity types or borrowing constraints. However, this view leaves out a substantial share of the entrepreneurial landscape. Roughly 15 percent of business owners supply fewer than 20 hours per week to their business and account for less than 5 percent of total sales. These entrepreneurs look very different from the ones that anchor the existing narrative. Survey evidence shows that nearly half cite non-pecuniary reasons for remaining small. Rather than reflecting productivity or credit limitations, these patterns suggest that many entrepreneurs may be small by choice. Understanding the behavior of this group is essential for evaluating policies that expand credit access, which implicitly assume that small businesses are primarily constrained rather than opting into small scale.

Using data from the Survey of Consumer Finances, I document four empirical patterns that clarify this behavior. First, entrepreneurial hours are highly dispersed, with a large mass of business owners supplying very few hours relative to both other entrepreneurs and workers. Second, hours are strongly correlated with business scale: low-hour entrepreneurs run much smaller business in terms of employment and sales revenue. Third, hours co-move with business assets, with low hour entrepreneurs holding substantially fewer assets than those who devote full time effort. Fourth, profitability per hour declines sharply with hours, with the highest margins earned by entrepreneurs supplying the fewest hours, which contradicts the idea that small scale reflects low productivity. [Hurst and Pugsley \[2011\]](#) further show that more than half of entrepreneurs report non pecuniary motives. Taken together, these facts point toward an interpretation in which differences in how entrepreneurs value their own time, rather than productivity or finance alone, drive persistent differences in hours and scale.

These patterns motivate the central mechanism I study. Variation in how entrepreneurs value their time provides a natural explanation for the large dispersion in hours supplied: entrepreneurs who place a higher value on non-work time, whether due to leisure preferences, family responsibilities, home production, or a desire for flexibility, choose to supply fewer hours to their businesses. Because hours are positively related to employment, revenues, and assets in the data, these differences in time valuation translate directly into differences in scale. This interpretation does not require that entrepreneurs differ fundamentally in productivity or access to finance; rather, it recognizes that entrepreneurs face different opportunity costs of time, and these costs shape their business

choices. This mechanism offers a unified way to interpret the coexistence of very small high profitability firms and larger lower profitability firms within the same environment and provides a disciplined foundation for analyzing how entrepreneurs respond to changes in credit conditions.

I ask two related questions. First, to what extent can heterogeneity in preferences for leisure account for the dispersion in entrepreneurial hours and scale observed in the data? Second, how do the welfare gains from relaxing collateral constraints depend on this heterogeneity? To address these questions, I extend a standard occupational choice model to incorporate persistent differences in preferences for leisure and complementarity between entrepreneurial hours and hired labor. Preference heterogeneity allows variation in the valuation of time to translate into the dispersion of hours, profitability, and assets seen in the data. Complementarity captures the positive correlation between entrepreneurial hours and size, permitting differences in preferred hours to generate differences in scale. A key feature of the model is that workers supply a fixed amount of labor, while entrepreneurs choose their hours endogenously; this asymmetry allows differences in time valuation to affect only the entrepreneurial margin, exactly as in the data. I calibrate the model using moments that discipline both the distribution of productivity and the distribution of hours, ensuring that the observed dispersion in scale is not mechanically attributed to one channel. The model reproduces several empirical relationships not directly targeted in calibration, including the wide dispersion of hours, the scaling of employment and revenues with entrepreneurial time, and the systematic variation in assets across hour groups. These untargeted successes validate the structure of the model and provide the foundation for the policy analysis.

The analysis yields two main findings. First, heterogeneity in preferences for leisure explains a substantial share of the observed dispersion in entrepreneurial hours and scale, providing a coherent interpretation of why many small firms remain small despite high profitability. Second, incorporating this heterogeneity significantly alters the predicted effects of credit expansion: assuming homogeneous preferences overstates the welfare gains from relaxing collateral constraints by approximately 20 percent.

In summary, I make four contributions. First, I document new empirical evidence on the wide dispersion of entrepreneurial hours and their systematic link to business size, asset accumulation, and profitability using the 2019 SCF. Second, I show that heterogeneity in preferences for leisure provides a coherent explanation for much of this dispersion, accounting for the behavior of low hour entrepreneurs and generating the observed relationships between hours, scale, and assets. Third, I demonstrate that ignoring this heterogeneity has important policy consequences: assuming homogeneous preferences leads to an overstatement of the welfare gains from relaxing collateral constraints by roughly 20 percent in the model's counterfactual experiments. Finally, I extend the standard

occupational choice framework to incorporate endogenous hours choices and complementarity between entrepreneurial hours and hired labor, a structure that proves essential for generating realistic scale responses and for capturing how hours, productivity, and credit interact in shaping entrepreneurial outcomes.

**Related Literature** I contribute to three strands of the literature: (i) small-firm preferences and non-monetary motivations, (ii) occupational choice with heterogeneous agents, and (iii) entrepreneurship growth, size, and financial constraints. Across these areas, I highlight individual preferences as a central, quantifiable determinant of entrepreneurial outcomes.

First, I build on research documenting the role of non-pecuniary motives in entrepreneurship. A substantial literature shows that many entrepreneurs choose to operate small businesses because they value autonomy, flexibility, or personal control. [Hurst and Pugsley \[2011\]](#) document that most small business owners have no desire to grow. [Hamilton \[2000\]](#) and [Moskowitz and Vissing-Jørgensen \[2002\]](#) show that the monetary returns to entrepreneurship are often lower than wage work, implying substantial non-pecuniary benefits. More recent structural work, including [Yurdagul \[2017\]](#) and [Sterk et al. \[2021\]](#), formalizes the role of flexibility and intrinsic heterogeneity in shaping entrepreneurial decisions. I contribute to this strand by introducing heterogeneity in leisure preferences that directly shapes the entrepreneurial hours decision, making time input—and therefore business scale—an endogenous margin that generates the large dispersion in hours and its correlation with entrepreneurship size.

Second, I contribute to the occupational choice literature with heterogeneous agents frameworks featuring differences in wealth, productivity, and financial access. Foundational contributions include [Cagetti and Nardi \[2006, 2009\]](#), [Quadrini \[2000\]](#), [Kitao \[2008\]](#), [Buerger et al. \[2011\]](#), and [Brüggemann \[2021\]](#). These models are successful in explaining wealth inequality and the persistence of entrepreneurship across the distribution. However, while these frameworks allow for heterogeneity in wealth and productivity, entrepreneurial time input is typically not modelled as a behavioral choice shaped by preferences. I extend this literature by introducing leisure-preference heterogeneity that governs entrepreneurial hours, allowing hours, assets, and entrepreneurship size to be jointly determined in equilibrium. This mechanism produces empirical patterns—particularly the wide dispersion in hours and its link to firm scale—that cannot be replicated by wealth- or productivity-based heterogeneity alone.

Third, I contribute to the literature of entrepreneurship growth, size, and financial constraints. I examine why some entrepreneurs grow while others remain small. Classic theories of firm growth, such as [Jovanovic \[1982\]](#) and [Evans \[1987\]](#), show that young and

small firms tend to expand rapidly as they learn their productivity or converge toward efficient scale. Complementary work emphasizes financial frictions: [Evans and Jovanovic \[1989\]](#) and [Banerjee and Newman \[1993\]](#) link liquidity constraints to entrepreneurial entry and early growth; [Buera and Shin \[2013\]](#) and [Midrigan and Xu \[2014\]](#) show how financing conditions shape the allocation of capital and the size distribution of businesses. Within this set of quantitative models, [Nardi \[2006\]](#) and related work match the upper tail of the entrepreneurial distribution—large, high-asset, high-income entrepreneurs. However, these frameworks struggle to explain the large mass of small entrepreneurs who remain persistently small even when viable or when financial constraints are relaxed. Standard financial-friction models typically predict that such firms should grow once constraints ease, contrary to empirical evidence. I complement this literature by demonstrating that heterogeneity in leisure preferences—acting through the hours decision—can generate persistent small-scale entrepreneurship even in environments with relaxed credit constraints. This preference-driven mechanism explains why many entrepreneurs remain small by choice, a pattern that finance-only models cannot rationalize.

## 2 Data

This section introduces the dataset used in the analysis and then documents the key empirical patterns in entrepreneurial labor supply, entrepreneurial size, and asset accumulation. My paper draws on one primary dataset, the 2019 Survey of Consumer Finances (SCF). Conducted by the Federal Reserve Board, the SCF provides nationally representative, detailed cross-sectional information on household demographics, wealth, income, and business ownership.

Entrepreneurs are defined as respondents who own a privately held business, actively manage it, and employ at least one worker. I restrict the sample to individuals aged 25 and above to focus on those in their main working years. The analysis further limits the sample to cases where the business is the household’s primary source of income, ensuring that reported hours reflect meaningful choices that directly affect business size and performance.

This publicly available dataset offers a comprehensive snapshot of entrepreneurs and their businesses and allows me to document broad empirical patterns in entrepreneurial hours, size, and asset accumulation.

To better understand how entrepreneurial choices vary across individuals, I begin by documenting key empirical patterns using the 2019 SCF. Four facts stand out:

## 2.1 Entrepreneurial Hours are Highly Dispersed

Figure 1 illustrates a stark contrast in the distribution of weekly hours worked by entrepreneurs versus wage workers. Hours in wage employment are highly standardized: more than half of all wage workers report working exactly 40 hours per week, with relatively little variation around this norm. By contrast, entrepreneurs exhibit much greater dispersion in labor supply. While the most common group of entrepreneurs works between 20 and 40 hours weekly, a substantial share report working significantly more or less. Nearly 15 percent report fewer than 20 hours, and over 27 percent work more than 60 hours per week. On average, entrepreneurs work 44.3 hours per week, compared with 38.4 hours for wage workers. This wider dispersion is reflected in the standard deviation of hours worked: entrepreneurial hours have a substantially higher standard deviation (19.5 hours) than wage workers (11.5 hours). This wide variation highlights the inherently flexible and diverse patterns of labor supply among entrepreneurs.

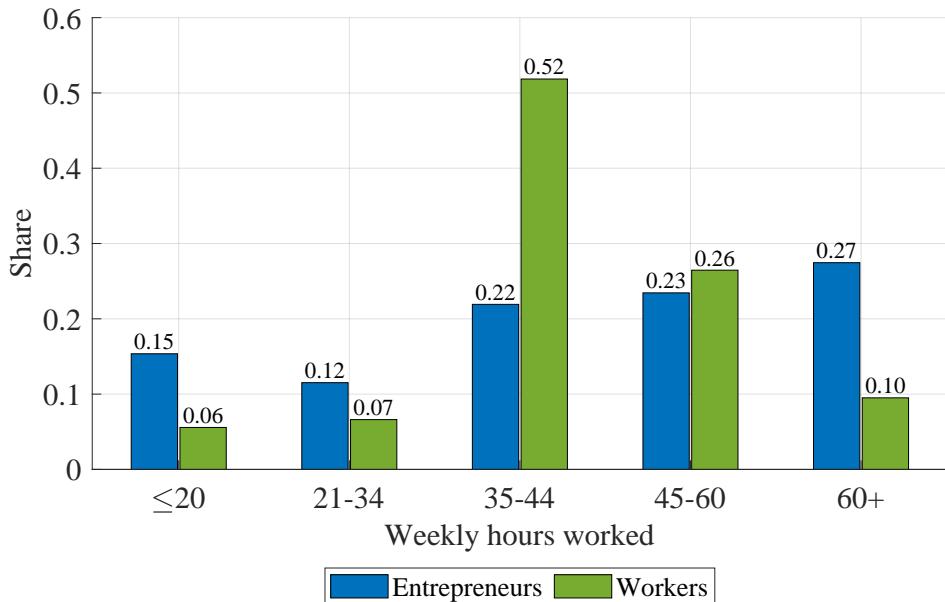


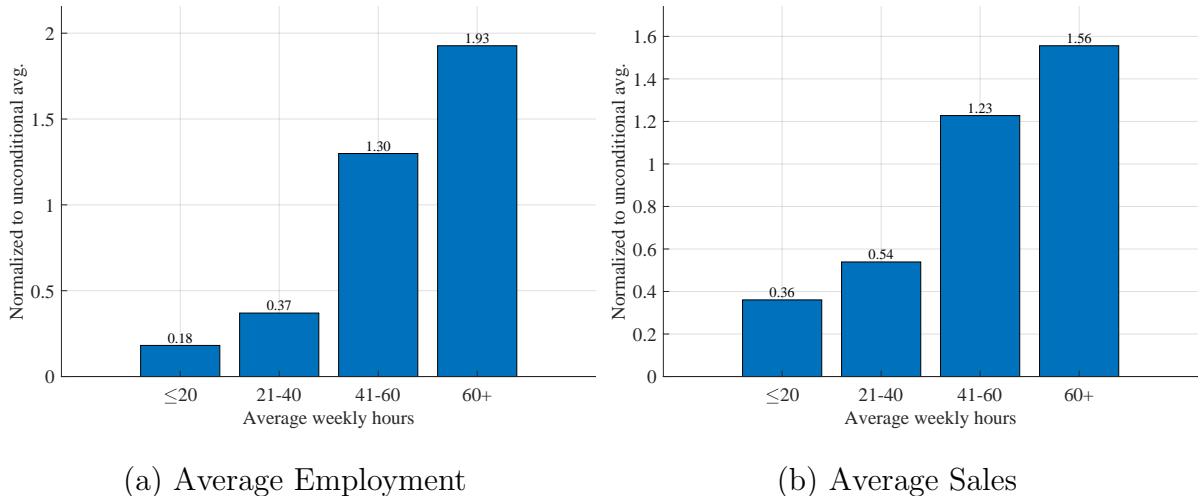
Figure 1: Weekly Hours for Entrepreneurs and Workers

Note: The figure reports the distribution of weekly hours supplied by entrepreneurs and workers. Hours are grouped into standard ranges, and the 35–44 hour category is selected to reflect full time working schedules. The vertical axis shows the share of entrepreneurs or workers in each weekly hours category.

## 2.2 There is a Positive Correlation Between Entrepreneurial Hours and Business Size

Figure 2 shows a clear positive relationship between entrepreneurial hours and scale, measured by annual sales and the number of employees. Businesses run by low-hour entrepreneurs are systematically smaller, while those managed by high-hour entrepreneurs are much larger. Businesses led by entrepreneurs working fewer than 20 hours per week generate only about one-third of average sales and less than one-fifth of average employment. At the other extreme, entrepreneurs working 60 or more hours operate businesses that reach roughly one-and-a-half times average sales and nearly twice average employment. The pattern is monotonic: as hours rise, so do entrepreneurial outcomes, with the largest businesses concentrated among long-hour entrepreneurs.

This positive association is important for two reasons. First, it demonstrates that differences in hours worked are closely tied to differences in entrepreneurial size. Second, the particularly strong relationship between entrepreneurial hours and employment suggests a complementarity between entrepreneurial labor supply and hired labor—an element that will be incorporated into the model.



(a) Average Employment

(b) Average Sales

Figure 2: Distribution of Entrepreneurial Size by Weekly Hours Worked

Note: Figure 2(a) plots average employment for each weekly hours bin, normalized by the unconditional mean of employment. Figure 2(b) plots average sales for each weekly hours bin, normalized by the unconditional mean of sales. The x axis reports weekly entrepreneurial hours; the y axis reports the corresponding normalized business size.

To further examine this relationship, Table 1 reports results from ordinary least squares (OLS) regressions of log employment size and log sales on entrepreneurial hours, controlling for age, gender, education, and industry fixed effects. The coefficient on hours is positive and highly significant across specifications. Quantitatively, an additional hour per week is associated with approximately 2.5 percent higher employment and 3.9 per-

Table 1: Regression of Log Entrepreneurial Size on Hours and Demographic Characteristics

Control Variable	Independent Variable	
	(1) Log Employment	(2) Log Sales
<b>Hours</b>	<b>0.025</b> (0.0018)	<b>0.039</b> (0.0024)
Age	0.049 (0.0184)	0.177 (0.0250)
Age <sup>2</sup>	-0.0003 (0.0002)	-0.0013 (0.0002)
Female	-1.014 (0.143)	-1.948 (0.194)
High School Diploma	0.218 (0.166)	0.359 (0.225)
Some College	0.159 (0.169)	0.713 (0.229)
Bachelor's and Above	1.260 (0.152)	2.270 (0.206)
Industry FE (2-digit)	-0.219 (0.075)	-0.475 (0.101)
Constant	-0.986 (0.535)	5.796 (0.727)
Observations	4,906	4,906
R-squared	0.099	0.154

cent higher sales. These results confirm that the descriptive patterns are not merely compositional but hold after accounting for observable characteristics of entrepreneurs and sectoral differences. The regression also highlights systematic patterns along other dimensions: women entrepreneurs tend to operate smaller business than men, while higher education—particularly a bachelor's degree or above—is strongly associated with larger businesses.

### 2.3 Entrepreneurs Who Supply Fewer Hours Are Asset Poor

Figure 3 shows that businesses run by entrepreneurs working fewer than 20 or 20–40 hours hold well below-average asset levels (asset poor). By contrast, firms operated by entrepreneurs working 41–59 or 60 or more hours hold above-average asset levels (asset-rich). The peak appears in the 41–59 hour range, though assets remain above the mean even among the longest-hour entrepreneurs. Overall, time spent in the business is associated with higher asset intensity, but not as strongly as with sales and employment.

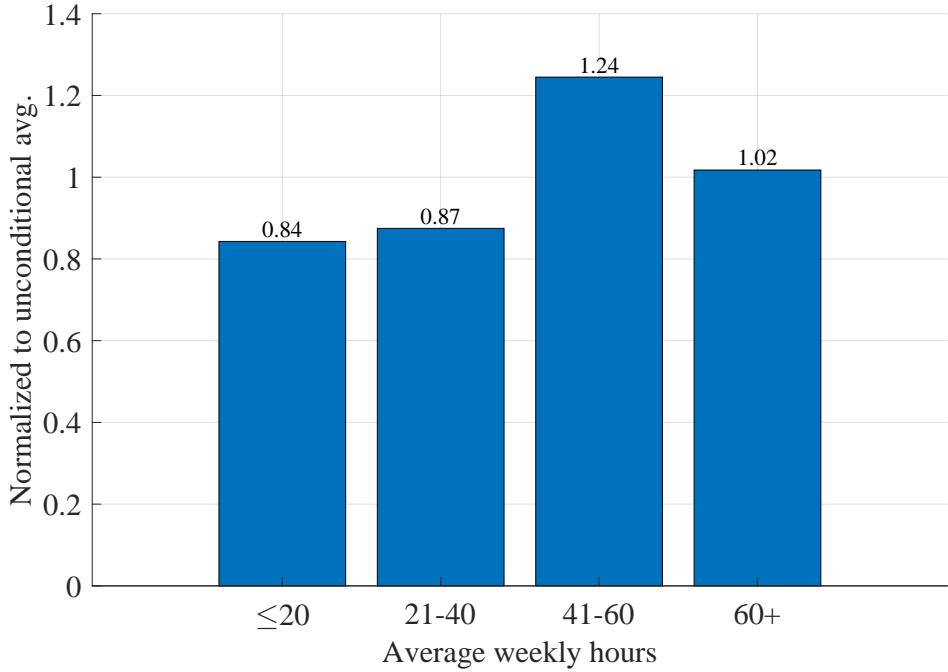


Figure 3: Average Wealth by Entrepreneur Hours

Note: The figure plots average entrepreneurial wealth for each weekly hours bin, normalized by the unconditional mean of wealth. The x axis reports weekly entrepreneurial hours, and the y axis reports the corresponding normalized average wealth.

## 2.4 Profitability Declines with Entrepreneurial Hours

I measure profitability as business income per entrepreneurial hour, normalized by the unconditional mean. Figure 4 reveals a clear monotonic pattern: profitability is highest among entrepreneurs supplying fewer than 20 hours per week and declines substantially as hours increase. Long-hour entrepreneurs operate much larger business, yet they exhibit systematically lower margins. By contrast, short-hour entrepreneurs—despite running the smallest operations—earn the highest returns per hour.

This pattern is notable because standard productivity-based explanations would predict the opposite: larger, more time-intensive firms should display higher profitability. The downward slope between hours and profitability therefore challenges the view that low-hour entrepreneurs are inherently low-productivity and indicates an additional dimension of heterogeneity not captured by productivity.

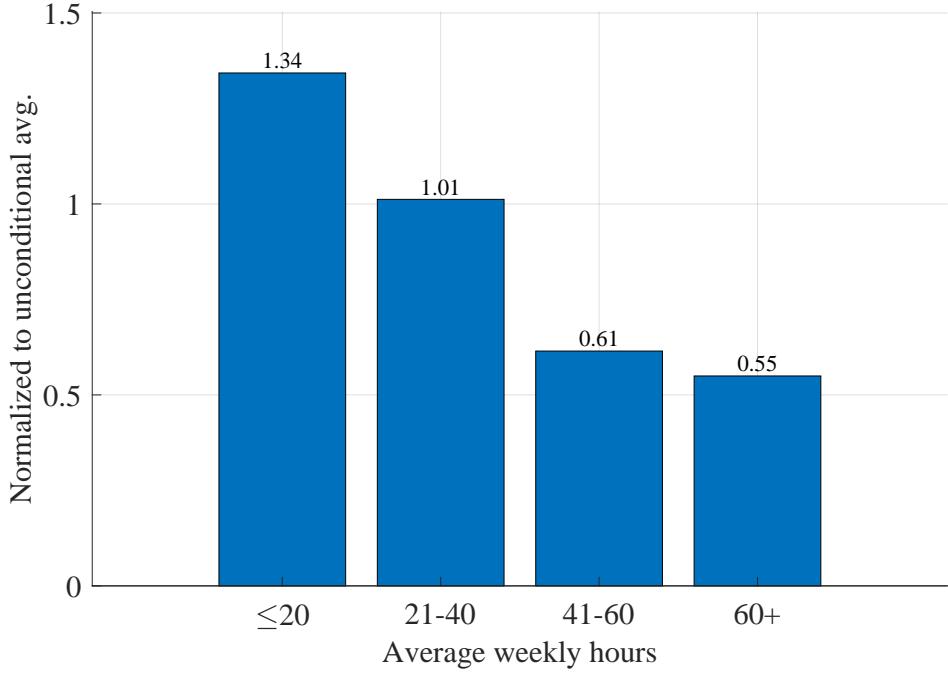


Figure 4: Average Profitability by Entrepreneur Hours

Note: The figure plots average entrepreneurial profitability for each weekly hours bin, normalized by the unconditional mean of profitability. Profitability is defined as average business income per entrepreneurial hour. The x axis reports weekly entrepreneurial hours, and the y axis reports the corresponding normalized average profitability.

The evidence above indicates that standard explanations for small scale entrepreneurship are incomplete. The profitability patterns show that entrepreneurs supplying the fewest hours earn the highest returns per hour, which is difficult to reconcile with a simple low productivity interpretation. Survey evidence from the PSED similarly suggests that financial constraints are not the dominant reason entrepreneurs remain small, as only a minority cite limited credit access as the primary barrier to expansion. Taken together, these facts point to a mechanism beyond productivity differences or binding financial frictions and highlight the importance of differences in how entrepreneurs value their own time.

Building on this insight, I introduce a model that incorporates preference heterogeneity and complementarity between entrepreneurial hours and hired labor to interpret these patterns. Preference heterogeneity provides a disciplined way to map differences in the valuation of time into differences in hours, profitability, and scale. Complementarity reflects the positive correlation in the data between entrepreneurial hours and size, allowing variation in preferred hours to translate into persistent differences in scale. This structure offers a coherent framework capable of explaining the empirical facts, including high profitability at low hours, limited evidence of binding credit constraints, and substantial variation in hours and business size.

### 3 Model

The model builds on the foundational framework of the [Bewley \[1986\]](#), [İmrohoroglu \[1989\]](#), [Huggett \[1993\]](#) and [Aiyagari \[1994\]](#) models with heterogeneous agents. It parallels the approach of [Cagetti and Nardi \[2006\]](#) by embedding occupational choice in a dynamic setting with heterogeneous agents. I extend this framework along two key dimensions. First, I introduce permanent heterogeneity in preferences for leisure, which allows individuals to differ in how much time they wish to devote to their businesses. Second, I allow for entrepreneurs to choose flexible work hours while workers' hours remain fixed. Third, I incorporate complementarity between entrepreneurial hours and hired labor in the production function, so that additional entrepreneurial time enhances the effectiveness of hired labor and enables businesses to scale.

#### 3.1 Demographics and Endowment

The model economy is composed of a continuum of risk-averse households of measure one. Individuals differ in their preference for leisure  $\lambda$  which is permanent throughout their life. Each household is endowed with an idiosyncratic entrepreneurial ability  $\epsilon$ , which evolves according to a Markov process. Individuals start their period with asset  $a$  and previous period occupation determines whether there will be a cost of entry into entrepreneurship. Every period, households decide whether to work as labor or operate as entrepreneurs. Conditional on this occupational choice, they select consumption ( $c$ ), savings ( $a$ ), the number of hours allocated to entrepreneurial activities ( $n$ ) as well as how much labor to hire( $l$ ). If a household chooses labor, they earn a wage rate ( $w$ ). If they opt for entrepreneurship, their earnings are derived from profits, which is contingent on their idiosyncratic entrepreneurial ability.

#### 3.2 Preferences

The household maximizes its lifetime utility given by:

$$E_0 \sum_{t=0}^{\infty} \beta^t U(c, h) \quad (1)$$

$$U(c, h) = \log c + \lambda \log(1 - h) \quad (2)$$

where  $\beta$  is the household's discount factor. Total hours worked are denoted by  $h$ , which takes the value  $n$  for entrepreneurial hours and  $\bar{h}$  for hours supplied in wage employment,

so  $h \in \{n, \bar{h}\}$ . In the model, entrepreneurial hours  $n$  can take any value in the interval  $[0, 1]$ , reflecting the flexibility entrepreneurs have over their time allocation, whereas hours in wage work are fixed at  $\bar{h} = 1/3$ . The parameter  $\lambda$  captures the individual's preference for leisure and determines the utility derived from leisure time.

### 3.3 Production Technology

Building on the work of [Quadrini \[2000\]](#) and [Cagetti and Nardi \[2006\]](#), the model includes two production sectors: a non-corporate entrepreneurial sector and a corporate sector.

*Entrepreneurial Sector:* The production technology for the entrepreneurial sector is given by:

$$F(k, \ell, n, \epsilon) = (Z\epsilon)^{1-\alpha\nu} (k^\alpha (n^\rho + \ell^\rho)^{(1-\alpha)/\rho})^\nu \quad (3)$$

Where  $\epsilon$  is the individual's entrepreneurial ability,  $k$  is the physical capital input,  $n$  denotes the entrepreneurial hours,  $\ell$  is the effective hired labor, and  $\alpha$  signifies the capital's share of output. Following [Lucas \[1978\]](#), the parameter  $\nu$  reflects the span of control and  $\rho$  indicates the degree of complementarity between entrepreneurial hours and hired labor. The profit function for the entrepreneurial sector is:

$$\Pi(k, \ell, n, \epsilon) = F(k, \ell, n, \epsilon) - (r + \delta)k - w(\ell + f^o) \quad (4)$$

where  $\delta$  is the depreciation rate of capital, and  $f^o$  is the fixed cost of operation measured in labor units.

*Corporate Sector:* The corporate sector operates under perfect competition and follows a standard Cobb-Douglas production function:

$$Y_c = F(K_c, L_c) = ZK_c^\alpha L_c^{1-\alpha} \quad (5)$$

where  $K_c$  and  $L_c$  are the capital and labor inputs in the corporate sector, respectively.

### 3.4 Household's problem

The household enters the period with assets  $a$ , entrepreneurial ability  $\epsilon$ , leisure preference  $\lambda$ , and its previous occupation  $d \in \{0, 1\}$ , where  $d = 1$  denotes that the household operated a business in the previous period. He then makes a decision whether to become an entrepreneur or worker. If he was a worker in the previous period and chooses to become

an entrepreneur he faces a fixed cost of entry. The household's problem is therefore given by:

$$V(\epsilon, a, d_{-1}, \lambda) = \max \left\{ V^e(\epsilon, a, d_{-1}, \lambda), V^\omega(\epsilon, a, \lambda) \right\} \quad (6)$$

where  $V^e$  and  $V^\omega$  denote the value functions under entrepreneurship and wage work respectively, and incorporate optimal choices of hours, inputs, consumption, and savings.

### 3.5 Entrepreneur's Problem

Entrepreneurs maximize their lifetime utility by choosing their consumption sequence ( $c$ ), entrepreneurial work hours ( $n$ ), and savings ( $a$ ), subject to their budget constraint and feasibility conditions. The value function for entrepreneurs is denoted by  $V^e$

$$V^e(\epsilon, a, d_{-1}, \lambda) = \max_{c, a', n, k, \ell} \left\{ \log c + \lambda \log(1 - n) + \beta \chi E_{\epsilon'|\epsilon}[V^H(\epsilon', a', d' = \omega, \lambda)] \right\}. \quad (7)$$

subject to

$$c + a' + I_{(d_{-1}=\omega)} w f^e \leq (1 + r)a + \Pi(k, \ell, n, \epsilon)$$

$$a' \geq 0$$

$$c \geq 0$$

$$\ell \geq 0$$

$$n \in [0, 1]$$

$$k \leq \zeta a$$

Individuals face a probability  $1 - \chi$  of dying in the subsequent period, at which point they are replaced by their offspring. Entrepreneurs transitioning from worker status incur a fixed cost of entry,  $f_e$ , measured in labor units.

### 3.6 Worker's Problem

Workers choose consumption and savings to maximize lifetime utility, supplying a fixed inelastic amount of labor  $\bar{h}$  each period in return for the wage  $w$ . They face the occupa-

tional choice again in the next period, conditional on surviving.

$$V^\omega(\epsilon, a, \lambda) = \max_{c, a'} \left\{ \log c + \lambda \log(1 - \bar{h}) + \beta \chi E_{\epsilon'|\epsilon} [V^H(\epsilon', a', d' = w, \lambda)] \right\}. \quad (8)$$

subject to

$$c + a' \leq (1 + r)a + w\bar{h}$$

$$a' \geq 0$$

$$c \geq 0$$

### 3.7 Stationary Equilibrium

Let  $s = (\epsilon, a, d_{-1}, \lambda) \in S$  be the state vector. A stationary equilibrium is defined by a sequence of prices  $\{r, w\}$ , the policy functions  $d_o(s), c(s), a'(s), n(s), l(s), k(s)$  and the distribution of households over the state variables  $s : \omega(s)$ , such that:

- The policy functions  $d_o(s), c(s), a'(s), n(s), l(s), k(s)$  solve the household's problem given in (6)
- The marginal products of capital and labor equal the rental rate  $r$  and wage rate  $w$ , respectively:

$$w = (1 - \alpha)Z\left(\frac{K_c}{L_c}\right)^\alpha \quad (9)$$

$$r = \alpha Z\left(\frac{K_c}{L_c}\right)^{\alpha-1} - \delta \quad (10)$$

- Capital and labor markets clear

$$\int_\omega n_\omega = L_c + \int_e l(s) \quad (11)$$

$$\int_{\omega, e} a(s) = K_c + \int_e k(s) \quad (12)$$

- The stationary distribution of households satisfies:

$$\omega = \Omega(\omega) \quad (13)$$

## 4 Calibration and Model Validation

The model is calibrated to match key moments from the U.S. economy, focusing on the characteristics and behaviors of entrepreneurs. The period length is one year. Some pa-

rameters are taken directly from the macroeconomic literature, while others are internally calibrated to match moments from the data.

## 4.1 External Calibration

Table 2 reports the externally calibrated parameters. Worker hours are fixed at  $\bar{h} = 1/3$ , corresponding to a standard 40-hour workweek, while entrepreneurial hours are chosen endogenously. The capital share is set to  $\alpha_c = 0.33$  following [Gollin \[2002\]](#). The span-of-control parameter governing diminishing returns in entrepreneurial production is set at  $\nu = 0.8363$  as in [Khan and Thomas \[2008, 2013\]](#). The depreciation rate is  $\delta = 0.06$ , consistent with [Stokey and Rebelo \[1995\]](#). The survival probability is chosen to imply an expected working life of approximately 45 years.

Table 2: External Calibration

Parameter	Symbol	Source	Value
Labor hour unit	$\bar{h}$	Full-time weekly hours = 40	0.33
Capital share in corporate sector	$\alpha_c$	<a href="#">Gollin [2002]</a>	0.33
Span of control parameter	$\nu$	<a href="#">Khan and Thomas [2008, 2013]</a>	0.84
Collateral constraint	$\zeta$	<a href="#">Kitao [2008]</a>	1.50
Depreciation rate	$\delta$	<a href="#">Stokey and Rebelo [1995]</a>	0.06
Annual survival probability	$\chi$	Average work life span = 45	0.98

## 4.2 Internal Calibration

Table 3 shows the remaining parameters, which are internally calibrated to match key moments of entrepreneurial behavior and outcomes. The discount factor  $\beta = 0.99$  is chosen to match the aggregate capital–output ratio. The fixed entry cost  $f^e = 0.002$  replicates the observed entry rate of 2.3 percent. Heterogeneity in preferences for leisure is governed by  $(\mu_\lambda, \sigma_\lambda)$ , which are set to match the mean and standard deviation of entrepreneurial hours in the SCF.

Entrepreneurial ability  $\epsilon$  follows an AR(1) process. The parameters  $(\mu_\epsilon, \sigma_\epsilon)$  of the process are calibrated to match the share of entrepreneurs and the dispersion of gross sales across entrepreneurs.

Finally, the elasticity of substitution between entrepreneurial time and hired labor,  $\rho$ , is selected to replicate the empirical correlation between average employment and average

hours across entrepreneurs, implying strong complementarity between entrepreneurial hours input and hired labor.

Table 3: Internal Calibration

Parameter	Symbol	Value	Target Moment	Data	Model
Discount factor	$\beta$	0.99	Capital–output ratio	2.65	2.69
Fixed cost of entry	$f^e$	0.02	Entry rate	0.02	0.02
Mean preference for leisure	$\mu_\lambda$	0.11	Avg. entrepreneurial hours	0.38	0.38
Std. dev. preference for leisure	$\sigma_\lambda$	0.10	Std. dev. entr. hours	0.12	0.20
Mean entrepreneurial ability	$\mu_\epsilon$	0.34	Share of entrepreneurs	0.06	0.06
Std. dev. entrepreneurial ability	$\sigma_\epsilon$	0.02	Std. dev. gross sales	0.40	0.46
Hours–labor complementarity	$\rho$	-2.20	Corr. of avg. $n$ and avg. $h$	0.90	0.99

## 5 Results

### 5.1 Model Validation

This section evaluates the model’s ability to replicate core empirical regularities in entrepreneurial behavior by entrepreneurial hours along (i) shares of entrepreneurs, (ii) average business size, (iii) average assets, and (iv) average profitability. Importantly, these moments are not directly targeted in the calibration, so the comparison provides a meaningful out-of-sample validation of the model.

Figure 5a compares the shares of entrepreneurs working in each category of weekly hours. The model reproduces the high dispersion observed in the data, with large shares of entrepreneurs working moderate hours (20–40 and 41–59) or very long hours (60+), and a smaller but visible group working fewer than 20 hours.

Figure 5b and 5c shows that business size, measured by both employment and sales, rises with entrepreneurial hours. Entrepreneurs working fewer than 20 hours operate the smallest businesses, while those supplying more time run larger businesses. Both employment and sales increase across the hour groups, with the largest firms appearing among entrepreneurs working 41–59 hours and 60 or more. The model captures the positive correlation between entrepreneurial hours and business size.

Figure 5d shows average asset holdings by weekly hours group, normalized by the overall mean for entrepreneurs. Incorporating preference heterogeneity allows the model to

generate substantial variation in asset holdings within every hours group, yielding both asset-poor and asset-rich entrepreneurs. The model, however, places a larger share of high-asset entrepreneurs in the low-hours group than the data suggest.

Figure 5e shows average profitability by weekly hours worked. In the data, profitability is highest among entrepreneurs working fewer than 20 hours and declines sharply across the higher hour groups. The model also produces a downward gradient, with profitability falling gradually as hours increase.

Taken together, these results show that the model reproduces several central empirical patterns linking entrepreneurial hours to their outcomes. It matches the observed shares of entrepreneurs across hours groups, captures the strong positive correlation between hours and business size, and generates substantial heterogeneity in asset holdings and profitability across groups. The model’s ability to replicate these untargeted moments provides credible support for the mechanisms embedded in the framework—particularly the role of preference heterogeneity in shaping entrepreneurial choices and outcomes.

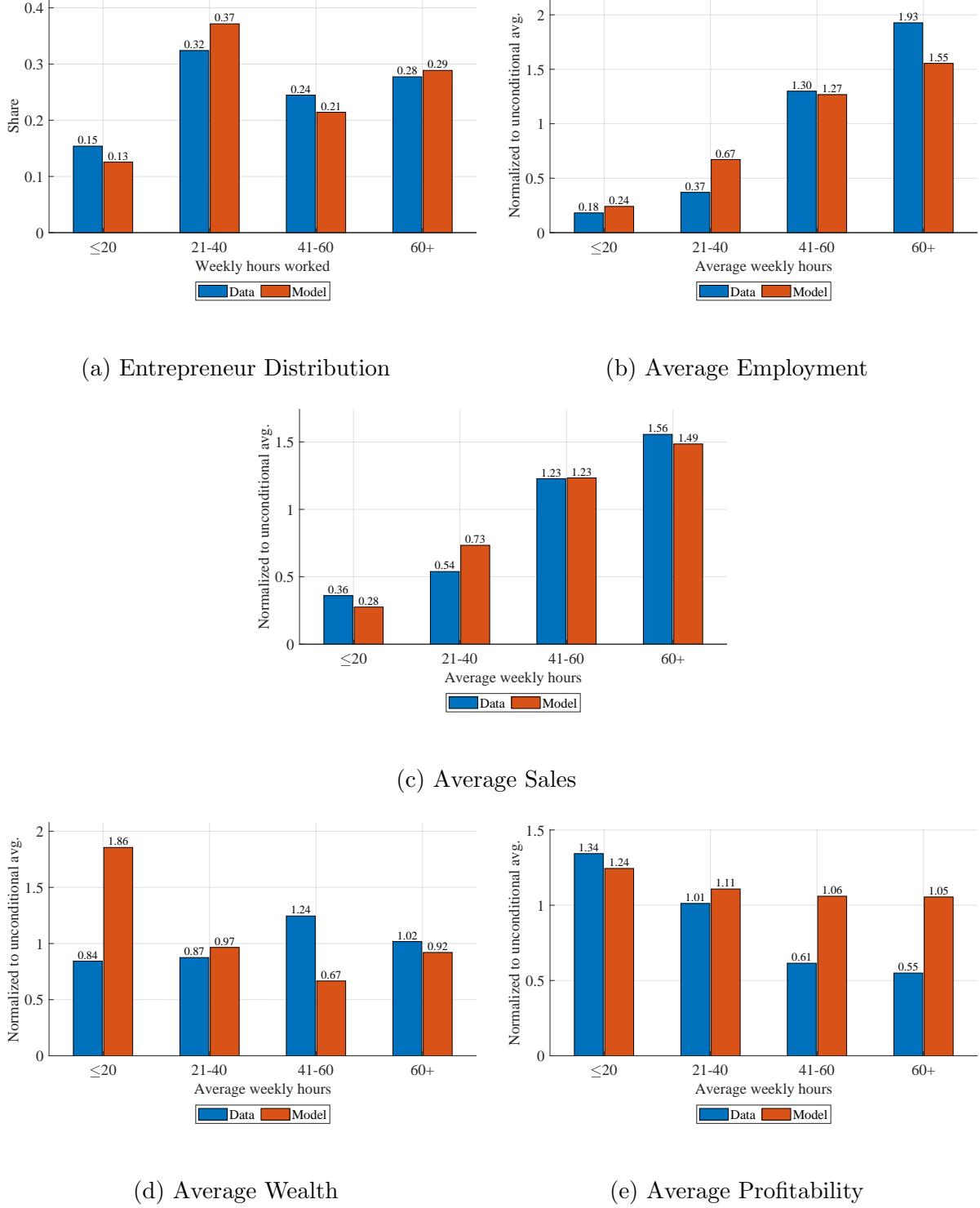


Figure 5: Model and data across entrepreneurial hours bins

Note: Figure 5a summarizes the distribution of entrepreneurs across hours bins. Figures 5b, 5c, 5d, and 5e show how employment, sales, entrepreneurial assets, and profitability vary with hours supplied, with all measures normalized by their unconditional means. Blue denotes data values and red denotes model generated values.

## 5.2 Role of Preference Heterogeneity

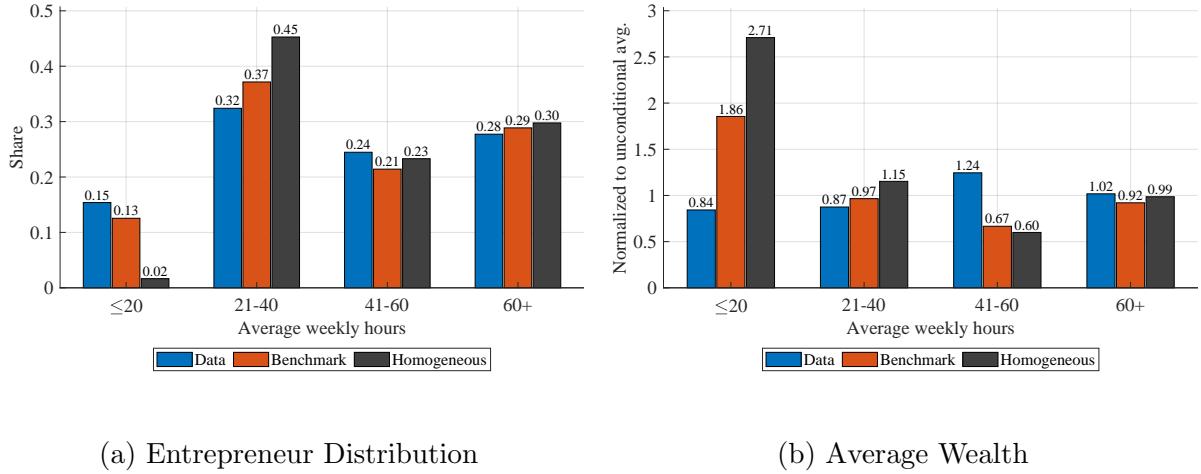
The results compare outcomes in the benchmark environment, where entrepreneurs have heterogeneous preferences for leisure, to a counterfactual environment in which preferences are homogeneous. In the counterfactual, entrepreneurs still choose hours endogenously, but all individuals have the same preference for leisure. This comparison shows how removing preference heterogeneity changes both the distribution of entrepreneurs across hours categories and the associated pattern of asset holdings.

Figure 6a shows the share of entrepreneurs in each weekly hours category. In the benchmark environment, about 12 percent of entrepreneurs work fewer than 20 hours per week, which aligns well with the empirical share of entrepreneurs who supply a small amount of time to their business. When preferences are homogeneous, this group almost disappears: fewer than 2 percent of entrepreneurs choose to work fewer than 20 hours. Without preference heterogeneity, no entrepreneurs opt for very low hours, and almost all entrepreneurs fall into the middle and high hour ranges. As a result, the counterfactual environment places too many entrepreneurs in the higher hours categories, while the benchmark environment captures the observed variation in hours more accurately.

Figure 6b reports average asset holdings by weekly hours group. Although the benchmark environment already overstates assets in the group that works a small number of hours, the counterfactual environment amplifies this overstatement substantially. With homogeneous preferences, the only entrepreneurs who choose to work very few hours are those with extremely high asset levels who can maintain viable operations while supplying very little labor. This selection pattern pushes average assets in the low hours category far above what is observed in the data. In contrast, the benchmark environment allows both low asset and high asset entrepreneurs to work few hours, creating a mix that is qualitatively consistent with the empirical evidence, even if some level differences remain.

Taken together, the figures show that removing preference heterogeneity nearly eliminates entrepreneurs who work very few hours and creates an unrealistically wealthy group among the small set who remain in that category. In contrast, the benchmark environment generates a more realistic mix of hours choices and asset profiles that aligns more closely with the empirical patterns. These differences are not only relevant for matching the data but also have direct implications for policy evaluation. Because the counterfactual environment with homogeneous preferences compresses hours choices and concentrates wealth among those who supply little labor, it fundamentally alters who is financially constrained and who is not. As a result, the effectiveness of policies that relax borrowing constraints may look quite different once preference heterogeneity is taken into account. The next section examines this question directly by comparing the effects of credit expansion in the benchmark environment to those in the homogeneous preferences

environment, allowing a clear assessment of how much preference heterogeneity matters for measuring policy impact and welfare gains.



(a) Entrepreneur Distribution (b) Average Wealth

Figure 6: Homogeneous-Preference Environment

Note: Figure 6a shows the distribution of entrepreneurs across weekly hours bins on the x axis, with the y axis reporting the share of entrepreneurs in each bin. Figure 6b reports average entrepreneurial wealth for the same hours bins on the x axis, with the y axis showing average wealth normalized by its unconditional mean. In both figures, blue bars represent the data, red bars represent the benchmark model with heterogeneity in preferences for leisure, and black bars represent the environment in which heterogeneity in preferences is switched off so that all individuals share the same preference for leisure.

### 5.3 Role of Entrepreneurial Hours-Labor Complementarity

This subsection evaluates the importance of entrepreneurial hours-labor complementarity by comparing the benchmark environment to an alternative environment in which entrepreneurial hours and hired labor are substitutes rather than complements. In the benchmark, entrepreneurial time is an essential input for expanding entrepreneurship scale, so hours and hired labor reinforce one another. In the substitute environment, by contrast, entrepreneurs can replace their own time with hired labor. Comparing these two environments isolates how the strength of this technological relationship shapes the allocation of hours, the scale of business, and the joint patterns observed in the data.

Figure 7a shows that removing complementarity substantially distorts the distribution of entrepreneurial hours. In the substitute environment, many entrepreneurs bunch into the 21–40 hour range, but both very low hours and very high hours become much more common relative to the benchmark. This pattern arises because, when own hours and hired labor can be substituted, entrepreneurs with strong preferences for leisure can operate sizable businesses with minimal personal time by hiring workers in place of supplying their own hours. They therefore appear as low-hour entrepreneurs despite running relatively large businesses. Conversely, entrepreneurs who have low preference for leisure

supply more of their own labor, but because hired labor can easily replace much of their time, they do not find it optimal to expand hours to very high levels. As a result, the substitute environment generates too many low-hour entrepreneurs and almost no very high-hour entrepreneur, a sharp contrast from both the data and the benchmark model, where complementarity produces a more realistic spread of hours choices.

Figure 7b and Figure 7c show how the removal of complementarity alters the relationship between entrepreneurial hours and business scale. In the benchmark environment, entrepreneurial size increases with hours supplied, consistent with the empirical pattern that entrepreneurs who devote more time operate larger businesses. In the substitute environment, this relationship reverses: entrepreneurs supplying very few hours now manage the largest businesses, while those supplying many hours operate disproportionately small ones. When hired labor can easily replace entrepreneurial time, entrepreneurs with strong preferences for leisure can scale up by hiring more workers, while those who supply more of their own time find that additional hours do not meaningfully raise entrepreneurship size. This reversal produces a negative association between hours and scale, a pattern that contradicts both the data and the benchmark model's replication of it.

Figure 7d displays the implications for profitability. In the benchmark environment, profitability varies smoothly across hours groups and aligns with the empirical pattern in which low-hour entrepreneurs tend to operate modestly profitable small business. The substitute environment produces a very different outcome. Because entrepreneurs with strong preferences for leisure can operate large businesses while supplying few hours, the lowest-hours group becomes populated by extremely wealthy and highly profitable entrepreneurs. This concentration of high-wealth, low-hour entrepreneurs creates a profitability pattern that diverges sharply from the data. In contrast, the benchmark environment—with complementarity limiting the ability to substitute hired labor for entrepreneurial time—prevents this unrealistic outcome and maintains a more plausible link between hours worked, entrepreneurship size, and returns.

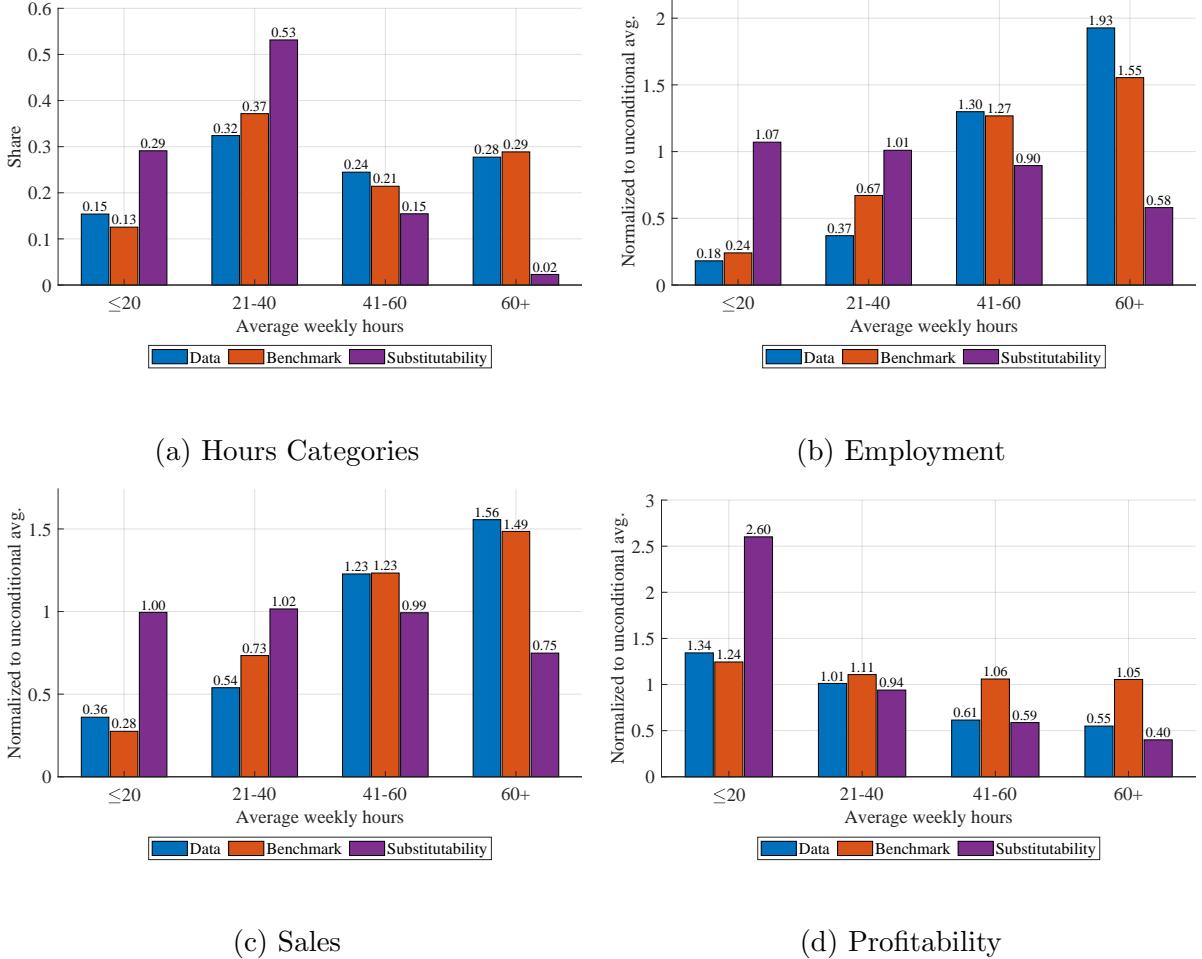


Figure 7: Substitute Hours–Labor Technology: Hours, Employment, Sales, and Profitability

Note: Figure 7a shows the distribution of entrepreneurs across weekly hours bins on the x axis, with the y axis reporting the share of entrepreneurs in each bin. Figures 7b, 7c, and 7d plot average employment, sales, and profitability for the same hours bins on the x axis, with each y axis reporting the corresponding normalized average value. Blue denotes the data, red denotes the benchmark model with complementarity between entrepreneurial hours and hired labor, and purple denotes the environment in which complementarity is switched off and replaced with a substitution technology, so entrepreneurs can substitute their own working hours by hiring additional labor.

## 6 Policy Experiment: Collateral Constraint Expansion

### 6.1 Experiment Design

This experiment evaluates the effects of relaxing the collateral constraint that limits how much entrepreneurs can borrow relative to their assets. The policy experiment increases this borrowing limit, enabling entrepreneurs to acquire more capital and operate at larger scales if doing so is optimal.

The key object of interest is how the economy responds to this policy in two environments. The first is the benchmark economy, where entrepreneurs differ in their preferences for leisure. The second is a counterfactual economy in which this preference heterogeneity is removed and all entrepreneurs share the same preference for leisure. Comparing these two environments isolates the extent to which the response to improved credit access reflects genuine financial constraints rather than differences in how individuals value leisure.

## 6.2 Aggregate Responses in Benchmark vs. Homogeneous Environments

Relaxing the borrowing limit increases the feasible capital choices for all entrepreneurs, but the extent of adjustment differs sharply across the two environments. When preferences are homogeneous, entrepreneurs place similar value on expanding their business, and the policy generates large increases in borrowing, capital, and entrepreneurship size. When preferences are heterogeneous, many entrepreneurs choose not to expand even when additional credit becomes available because their preferred labor supply places an internal limit on the scale they wish to operate.

As a result, the environment with homogeneous preferences exhibits a strong and broad scaling response, while the benchmark environment exhibits a much more muted adjustment. These differences already suggest that models with homogeneous preferences will overstate the impact of credit expansion policies.

Table 4: Effects of Relaxing Borrowing Limits on Aggregate Outcomes and Welfare

	Benchmark (%)	Homogeneous (%)
Share of Constrained Entrepreneurs	42.70	48.37
Change in output	10.86	11.54
Change in Consumption	5.48	5.77
Change in Capital	12.40	14.05
Change in Entrepreneurial Hours	6.81	6.95
Change in Hired labor	9.32	9.70
Welfare (CEV)	3.11	3.85

## 6.3 Welfare Effects Across Hours Group

Table 5 reports the welfare consequences of relaxing the collateral constraint across hours groups. In the benchmark environment, welfare gains are modest and concentrated among entrepreneurs working 21 to 41 and 41 to 60 hours, rising by 1.82 percent and 3.44 percent, respectively. Entrepreneurs who work fewer than 20 hours or more than sixty hours experience minimal improvements.

In the environment with homogeneous preferences, the response is substantially larger. Welfare gains exceed 11 percent for entrepreneurs working forty-one to sixty hours, and every hours group experiences larger improvements than in the benchmark. Aggregating across groups, welfare rises by 3.11 percent in the benchmark environment compared with 3.85 percent in the homogeneous preferences environment.

Taken together, these results show that ignoring preference heterogeneity overstates the aggregate welfare gains from credit expansion by roughly 20 percent. When entrepreneurs differ in how they value their time, many choose to remain small even when credit becomes more accessible, reducing the overall effectiveness of borrowing-based policies eased.

Overall, the experiment demonstrates that the effectiveness of credit-access policies depends critically on heterogeneity in entrepreneurial preferences. When individuals differ in how they value their time, many entrepreneurs optimally choose to remain small even when credit becomes more accessible. As a result, the aggregate effect of relaxing borrowing constraints is considerably more muted than in a world with homogeneous preferences, underscoring the importance of incorporating preference heterogeneity when evaluating the macroeconomic impact of credit-expansion policies.

Table 5: Consumption Equivalence Variation from Relaxing the Collateral Constraint

Hours Group	Benchmark (%)	Homogeneous (%)
$\leq 20$	1.66	0.00
21–40	1.82	0.47
41–60	3.44	11.10
60+	1.58	1.92
<b>Overall</b>	<b>3.11</b>	<b>3.85</b>

## 7 Conclusion

I have examined how heterogeneity in preferences for leisure shapes entrepreneurial decisions, entrepreneurial outcomes, and the effectiveness of policies that relax borrowing constraints. Using microdata from the Survey of Consumer Finances, I document four central empirical patterns: entrepreneurial hours are highly dispersed; hours are strongly related to entrepreneurship size in both employment and sales; hours co-move with business assets; and profitability per hour declines sharply with hours—patterns that standard models struggle to reconcile. These facts suggest that entrepreneurs differ not only in their productivity or access to credit but also in how they value their time, and that this heterogeneity is an important determinant of entrepreneurial scale.

To interpret these patterns, I extended a standard occupational choice model to incorporate endogenous hours choices, heterogeneity in preferences for leisure, and complementarities between entrepreneurial hours and hired labor. The calibrated model successfully replicates several empirical relationships—including the broad dispersion of entrepreneurial hours, the scaling of employment and revenues with hours, and the systematic variation in asset holdings across hour groups—despite these moments not being direct calibration targets. These validation exercises show that preference heterogeneity plays an essential role in generating the observed joint patterns between hours, scale, and assets.

I then quantified the importance of preference heterogeneity for evaluating credit-expansion policies. Comparing the benchmark environment with an otherwise identical environment in which all entrepreneurs share the same preference for leisure reveals stark differences. Without preference heterogeneity, almost no entrepreneurs work very few hours, and those who do are extremely wealthy—an implication that is counterfactual and reflects the absence of flexible labor-leisure tradeoffs. This selection pattern leads the homogeneous environment to overstate how tightly borrowing constraints bind and, consequently, to overstate how much entrepreneurs expand when credit becomes more accessible.

Relaxing the collateral constraint illustrates this clearly. In the homogeneous environment, the economy exhibits large increases in borrowing, capital, and entrepreneurial size, generating welfare gains exceeding 11 percent for mid-hour entrepreneurs. In contrast, in the benchmark environment many entrepreneurs optimally choose not to expand even when credit becomes cheaper, because their preferred hours of work constrain the scale they wish to operate. As a result, welfare gains are substantially smaller. Aggregating across groups, models that ignore preference heterogeneity overstate the welfare benefits of credit expansion by roughly 20 percent.

Taken together, the results highlight that entrepreneurial behavior is shaped by more than productivity and access to finance. Differences in how entrepreneurs value their time are fundamental for understanding business size, asset accumulation, and responsiveness to policy. Accounting for preference heterogeneity is therefore essential for producing accurate quantitative assessments of credit-access policies and for designing interventions that genuinely target constrained entrepreneurs.

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## A Appendix

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## A.1 Dispersion Across Gender, Age and Education

To better understand the sources of this dispersion, this paper examines variation across observable characteristics; gender, age and education

Gender provides some insight. Figure 8 shows that gender differences explain only a limited share of the observed heterogeneity. Women are underrepresented in entrepreneurship overall, making up only a small fraction of each hours category. Their share dips further in the 41–59 hour range, where they account for less than 1 percent, but in all other categories they remain at roughly 2–3 percent of entrepreneurs. The distribution of hours is therefore shaped primarily by variation among men, with gender contributing little to the overall dispersion.

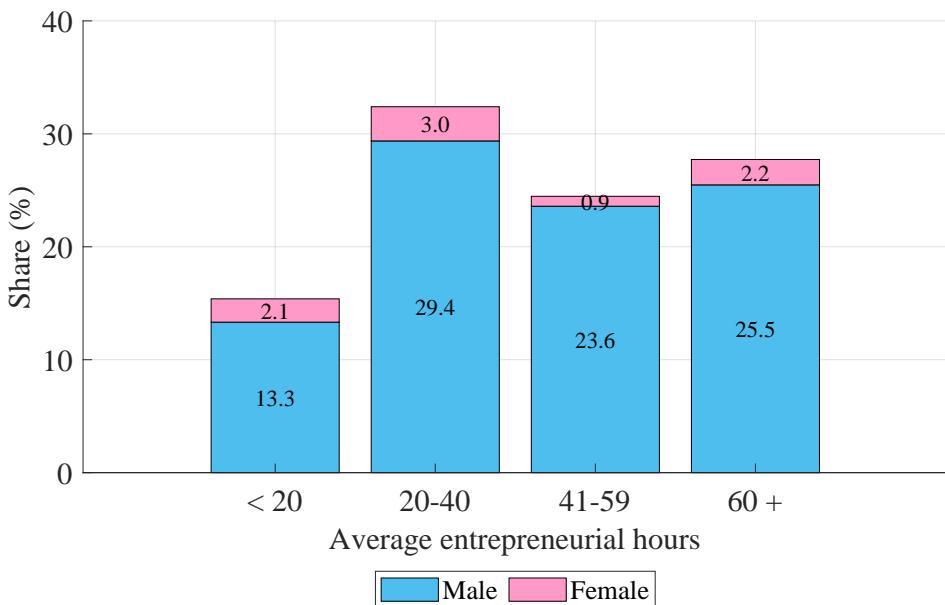


Figure 8: Entrepreneurial Hours Distribution by Gender

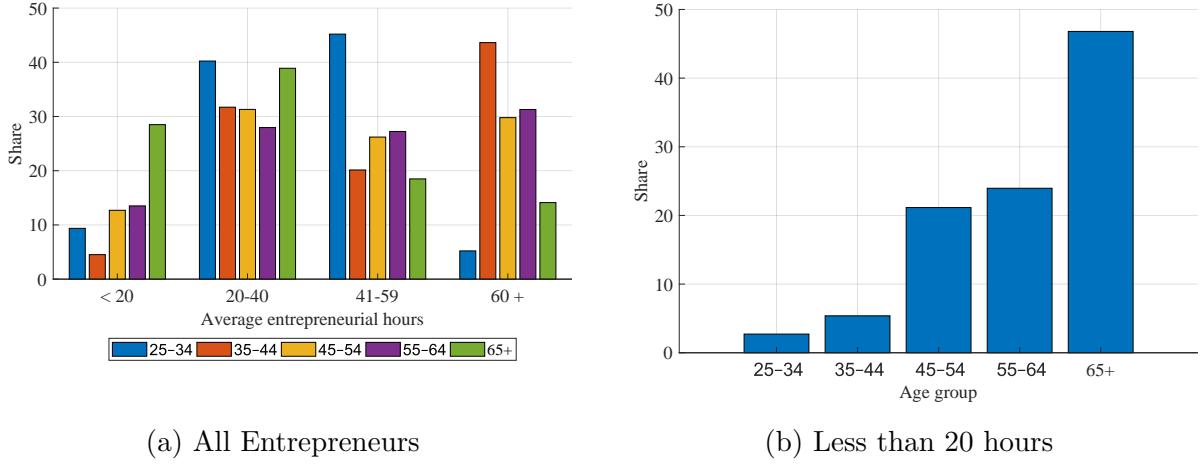


Figure 9: Distribution of Weekly Hours by Age

To understand how hours vary across the life cycle, Figure 9a shows the distribution of entrepreneurial hours by age group. Younger entrepreneurs, especially those aged 25–34, are clustered around a standard full-time workweek, with most falling in the 41–59 hour range. By contrast, older entrepreneurs display a more polarized pattern: many reduce their involvement to part-time levels, while others remain highly engaged with very long hours. Figure 9b illustrates this polarization, showing that the likelihood of working fewer than 20 hours rises steadily with age, consistent with gradual withdrawal from active business management.

These patterns indicate that age and life-cycle stage matter for entrepreneurial labor supply. Still, they do not fully account for the wide dispersion observed in the data. Even within the same age group, some entrepreneurs commit only minimal time while others devote 60 or more hours a week. Thus, while age helps explain part of the variation, a substantial share of the heterogeneity in entrepreneurial hours remains unexplained.

Entrepreneurial hours also differ by educational attainment, and two features are especially notable. Figure 10a shows that entrepreneurs without a high school diploma are the most concentrated in very long work weeks, with the majority reporting 60 or more hours. At the other end of the distribution, even among those with a bachelor’s degree or higher, around 15 percent work fewer than 20 hours per week. Figure 10b shows that more than half of all entrepreneurs in the under-20-hours category hold a bachelor’s degree or above.

These contrasts indicate that education shifts weight toward opposite tails: lower education is associated with very long workweeks, while higher education is more visible among those reporting short workweeks. Yet within every education group, there are entrepreneurs working only a handful of hours and others exceeding 60, leaving much of the variation unexplained.

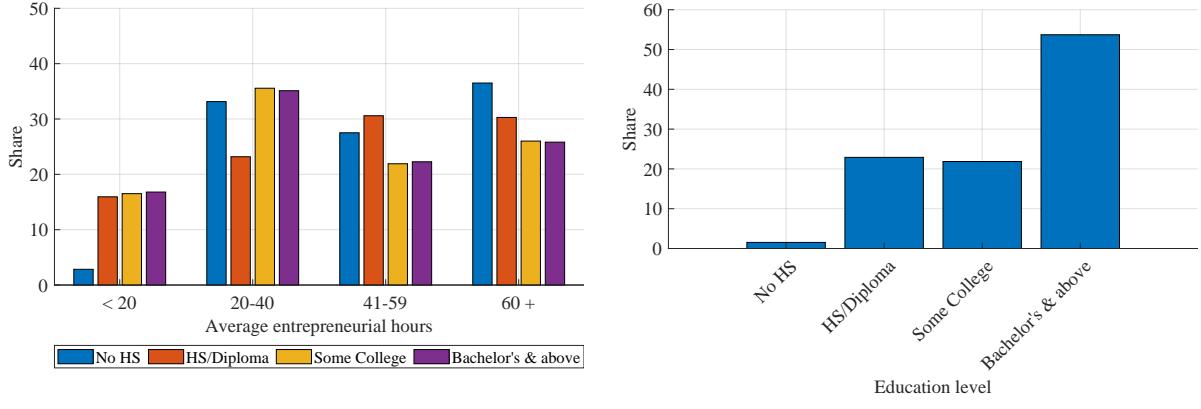


Figure 10: Distribution of Weekly Hours by Education Level

## A.2 Empirical Evidence from Alternative Dataset: SBO

The analysis below performs the same exercise using a different data source—entrepreneurial hours from the SBO and worker hours from the BLS. According to Figure 11, this alternative specification yields the same conclusion: entrepreneurial hours are far more dispersed than the relatively uniform hours worked by wage employees.

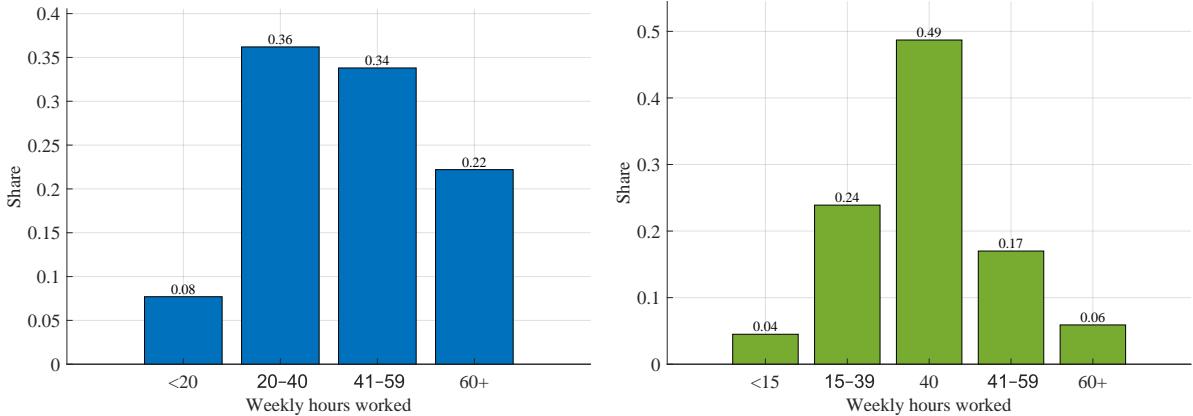


Figure 11: Distribution of Weekly Hours: Entrepreneurs vs. Workers

Figure 12 shows that the SBO data corroborates the positive association between hours worked and firm size: entrepreneurs who work fewer hours tend to run smaller businesses, measured by both employment and sales.

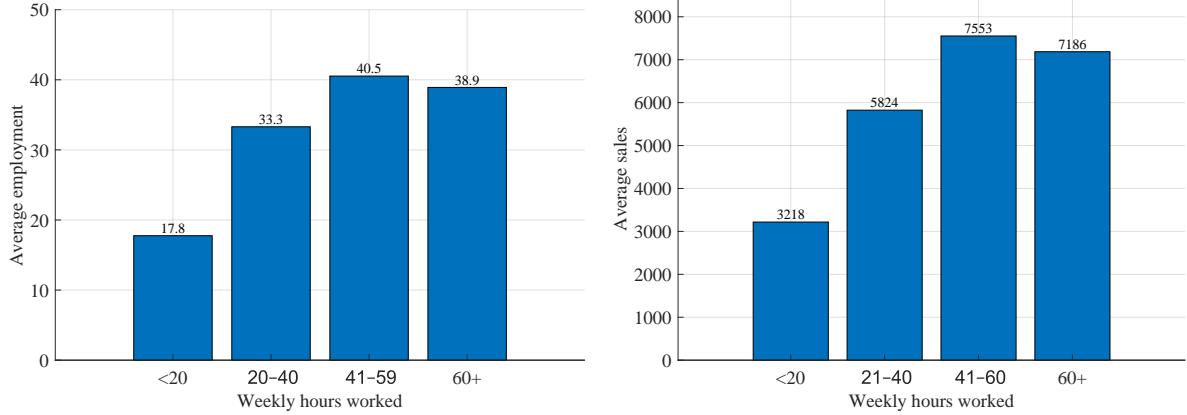


Figure 12: Entrepreneurial Hours and Business Size

Figure 14 illustrates how entrepreneurial hours vary across age groups. Younger entrepreneurs are concentrated at higher hour levels, whereas older entrepreneurs exhibit greater polarization, with more individuals at both low and high hours.

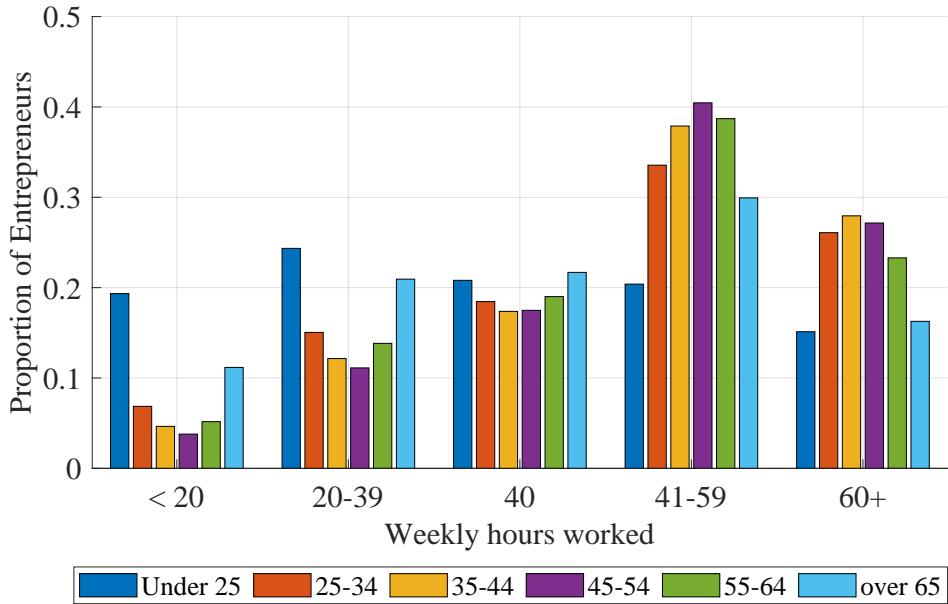


Figure 13: Less than 20 hours

Figure 14: Distribution of Weekly Hours by Age

Figure 15 and Table 6 collectively indicate meaningful heterogeneity in low-hour entrepreneurial activity across education groups. High school graduates and bachelor's degree holders constitute the highest proportions among entrepreneurs working fewer than 20 hours, while those with technical school or associate's degrees appear far less frequently. Overall, low-hour entrepreneurship does not follow a simple monotonic gradient with education.

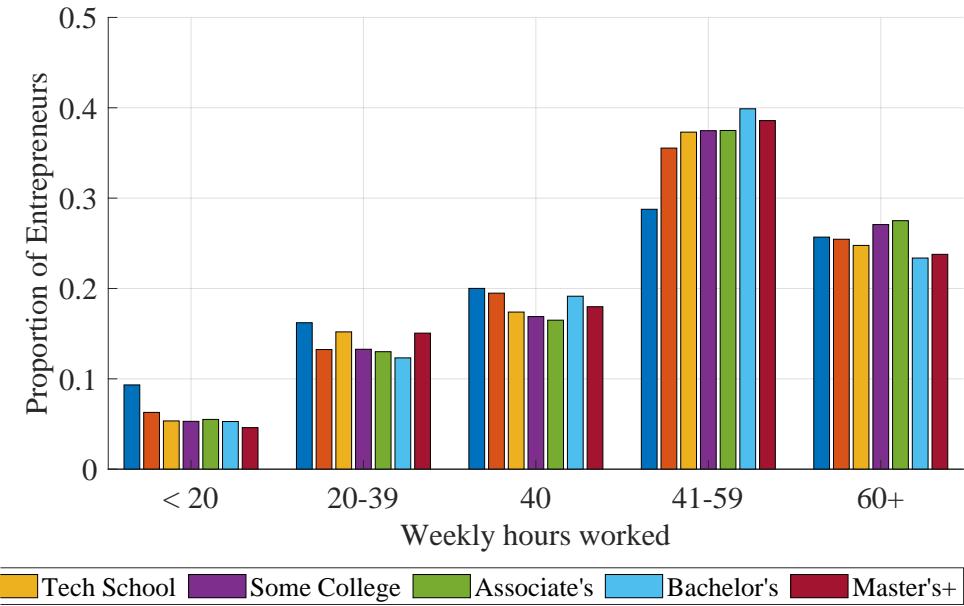


Figure 15: Entrepreneurial Hours Distribution by Education

<b>Education Level</b>	<b>Share of Entrepreneurs less than 20 Hrs</b>
Less than High School	0.10
High School	0.22
Technical School	0.07
Some College	0.16
Associate's	0.05
Bachelor's	0.23
Master's+	0.15

Table 6: Proportion of Entrepreneurs Working Less than 20 Hours by Education Level