Credit Expansion and the Scale of Entrepreneurship: The Role of Heterogeneous Leisure Preferences

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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.

1 Introduction

Entrepreneurs play a central role in wealth accumulation and economic activity, a fact traditionally attributed to differences in productivity and borrowing constraints. Yet a substantial share of entrepreneurs operate very small businesses: roughly 15 percent supply fewer than twenty hours per week to their business and account for less than five percent of total sales. Survey evidence indicates that nearly half of business owners cite non-pecuniary reasons for remaining small, while only around 8 percent cite financial frictions as the primary reason for not expanding. This suggests that many entrepreneurs may be small by choice rather than because of financing constraints, a pattern standard models do not capture. Understanding the behavior of these entrepreneurs is essential for evaluating the effectiveness of credit-expansion policies, which implicitly assume that small firms are primarily constrained by limited access to external finance.

Using data from the Survey of Consumer Finances (SCF), I document three empirical patterns. First, entrepreneurial hours are extremely dispersed, with a large share of business owners supplying fewer than twenty hours per week to their firms. Second, hours are positively correlated to business scale: entrepreneurs who devote fewer hours operate much smaller firms, reflected in lower employment and lower revenues. Third, hours also co-move with business assets, with low-hour entrepreneurs holding fewer assets than those who work full time in their firms. Evidence from the Panel Study of Entrepreneurial Dynamics (PSED) further underscores the importance of non-pecuniary motives, with more than 50 percent reporting non-pecuniary motives for their business choices. Taken together, these patterns point to entrepreneurial decisions that cannot be explained solely by differences in productivity or access to finance.

This paper asks two related questions. First, can the observed dispersion in entrepreneurial hours and firm size be explained by heterogeneity in preferences for leisure? 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 permanent differences in preferences for leisure and complementarity between entrepreneurial hours and hired labor. I calibrate the model to the United States economy. The model reproduces several empirical relationships that are not directly targeted, including the wide dispersion of hours supplied, the scaling of employment and revenues with entrepreneurial time, and the systematic variation in assets across hour groups. These untargeted successes validate the model's structure and form the basis for the subsequent policy analysis.

This paper makes four contributions. First, it documents new empirical evidence on the wide dispersion of entrepreneurial hours and their systematic link to business size and asset accumulation using the 2019 SCF. Second, it extends the standard occupational

choice model to incorporate endogenous hours choices, allowing differences in preferences for leisure to interact with productivity in a way that reproduces the observed patterns in hours, firm size, and asset distribution. Third, it demonstrates that preference heterogeneity has important policy implications: assuming homogeneous preferences leads to an overstatement of the welfare gains from relaxing collateral constraints by roughly 20 percent, as shown in the model's counterfactual experiments. Finally, the analysis highlights the complementarity between entrepreneurial hours and hired labor as a critical mechanism for firm growth, with its absence generating unrealistic scale responses.

Related Literature This paper contributes 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, it highlights individual preferences as a central, quantifiable determinant of entrepreneurial outcomes.

First, it builds 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. This paper contributes 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, it contributes 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], Buera 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. This paper extends 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, it contributes to the literature of entrepreneurship growth, size, and financial constraints. It examines 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. This paper complements 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 paper draws on two primary datasets. First, the 2019 Survey of Consumer Finances (SCF), conducted by the Federal Reserve Board, serves as the main source for cross-sectional data on entrepreneurs. The SCF provides detailed 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. The analysis further restricts 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.

Second, the Panel Study of Entrepreneurial Dynamics (PSED), a longitudinal dataset tracking a cohort of nascent entrepreneurs identified during 2005–2006 through six annual interviews, is used to examine entrepreneurial motivations and preferences. The PSED offers rich data on entrepreneurs' personal characteristics, business strategies, and, crucially, self-reported motivations for starting and maintaining their businesses, including preferences for non-pecuniary benefits such as leisure and flexibility. These data enable validation of inferences on leisure preferences drawn from the SCF.

Both datasets are publicly available and nationally representative. The SCF provides a

detailed cross-sectional snapshot of entrepreneurs and their businesses, while the PSED's longitudinal design captures individual dynamics in the entrepreneurial process. The two datasets are complementary: the SCF documents broad empirical patterns in entrepreneurial hours, firm size, and asset accumulation, while the PSED provides direct evidence on the role of preferences in shaping entrepreneurial choices.

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

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 wide spread highlights the flexible and individualized nature of entrepreneurial labor supply.
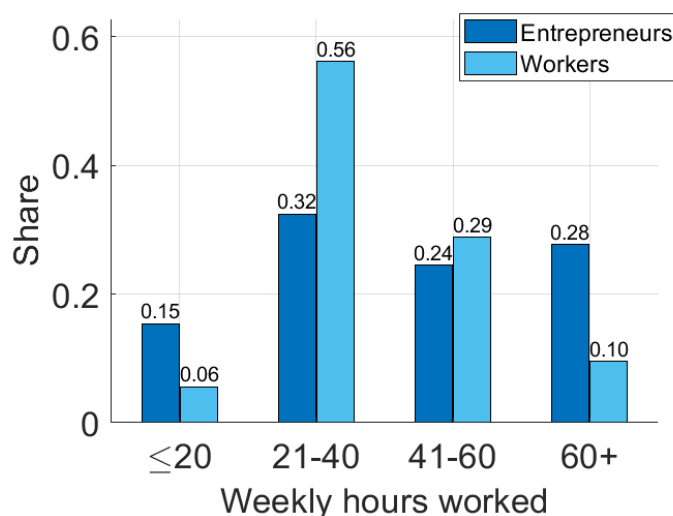

Figure 1: Distribution of Weekly Hours: Entrepreneurs vs. Workers

There is a Positive Correlation Between Entrepreneurial Hours and Business Size: Figure 16 shows a clear positive relationship between entrepreneurial hours and firm scale, measured by annual sales and number of employees. Firms run by short-hour entrepreneurs are systematically smaller, while those managed by long-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 firms that

reach roughly one-and-a-half times average sales and nearly twice average employment. The pattern is monotonic: as hours rise, so do firm 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 firm 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.
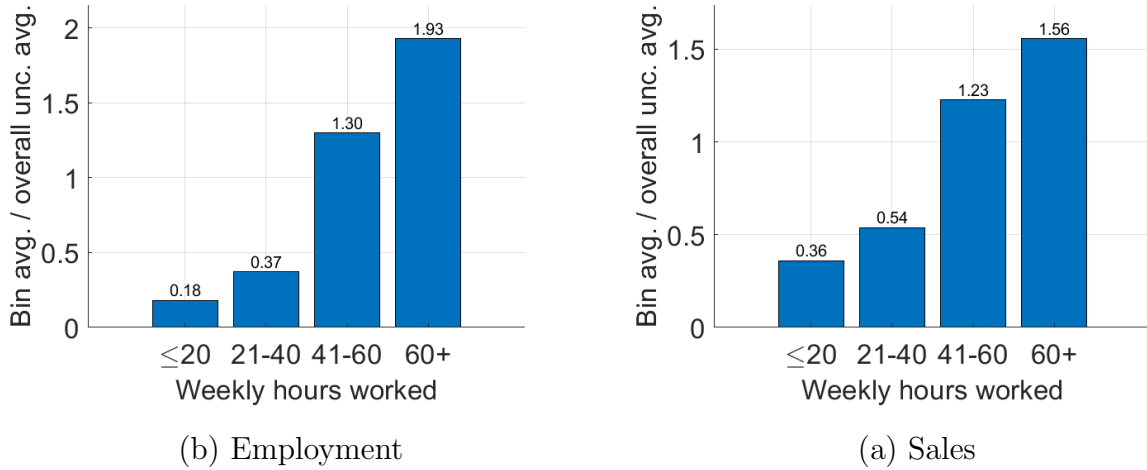

| (b) Employment | (a) Sales |

Figure 2: Distribution of Entrepreneurial Size by Weekly Hours Worked

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

Entrepreneurs Who Supply Fewer Hours Are Asset Poor: Figure 3 shows that the link between entrepreneurial hours and firm assets is positive, though less steep than for sales and employment. Firms 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

Table 1: Regression of Log Firm Size on Entrepreneurial Hours

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

Notes: Standard errors in parentheses. $^\dagger p < 0.10$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

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.
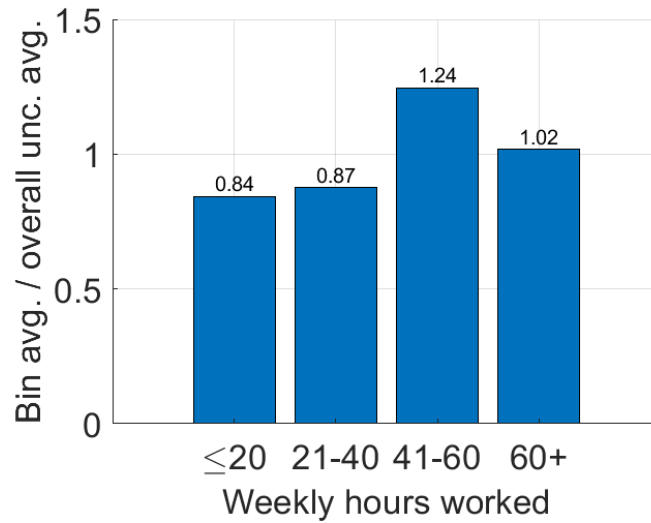

Figure 3: Average firm assets relative to the mean, by entrepreneur hours

Profitability Declines with Entrepreneurial Hours: Figure 4 plots average profitability—defined as business income per entrepreneurial hour normalized by the unconditional mean—across weekly hours bins. Profitability is highest among entrepreneurs supplying fewer than 20 hours and declines sharply as hours increase. This pattern shows that While long-hour entrepreneurs operate substantially larger firms, they do so at lower margins. Conversely, short-hour entrepreneurs—despite operating the smallest firms—exhibit the highest profitability relative to scale. The negative gradient between hours and profitability confirms an additional dimension of heterogeneity that is not captured by productivity or capital intensity alone.
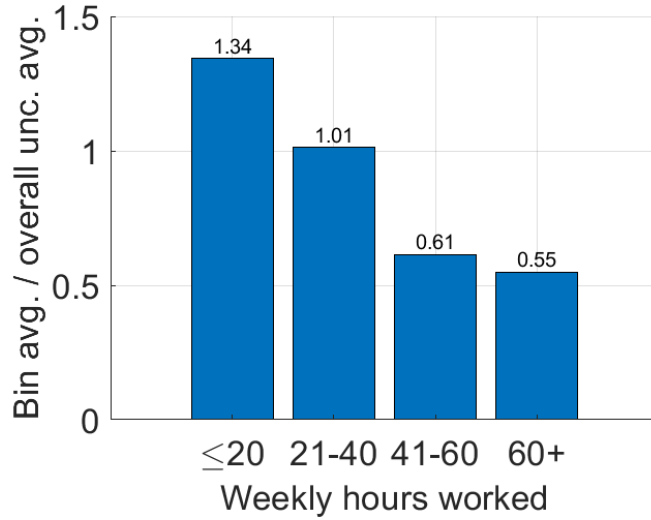

Figure 4: Average firm profit relative to the mean, by entrepreneur hours

The evidence above highlights substantial heterogeneity in how entrepreneurs allocate their labor and shows that these choices are systematically related to business outcomes. This suggests that underlying differences in preferences play an important role in shaping entrepreneurial behavior. To interpret these patterns and provide a coherent structure for understanding how hours, scale, and financial decisions interact, I now introduce a model that incorporates preference heterogeneity and complementarity between entrepreneurial hours and hired labor.

3 Model

The model builds on the foundational framework of the Bewley [1986], İmrohoroğlu [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 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 firms 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 λ which is permanent throughout their life. Each household is endowed with an idiosyncratic entrepreneurial ability ϵ, 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 it lifetime utility given by:

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

$$U(c, h) = log c + \lambda log(1 - h) \tag{2}$$

where β 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 λ 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:

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

Where ϵ is the individual's entrepreneurial ability, k is the physical capital input, n denotes the entrepreneurial hours, ℓ is the effective hired labor, and α signifies the capital's share of output. Following Lucas [1978], the parameter ν reflects the span of control and ρ indicates the degree of complementarity between entrepreneurial hours and hired labor. The profit function for the entrepreneurial sector is:

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

where δ 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:

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

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 ϵ, leisure preference λ, 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:

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

where V^e and V^ω 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

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

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

$$a' \geq 0$$

$$c \geq 0$$

$$\ell \geq 0$$

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

$$k \leq \zeta a$$

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

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

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

$$a' \geq 0$$

$$c \geq 0$$

3.7 Stationary Equilibrium

Let $s = (\epsilon, a, d_{-1}, \lambda) \in S$ be the state vector. An 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:

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

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

- Capital and labor markets clear

$$\int_\omega n_\omega = L_c + \int_e l(s) \tag{11}$$

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

- The stationary distribution of households satisfies:

$$\omega = \Omega(\omega) \tag{13}$$

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 parameters 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.

Parameter	Symbol	Source	Value
Labor hour unit	$\bar{h}$	Full-time weekly hours	40.00
Capital share in corporate sector	α_c	Gollin [2002]	0.33
Span of control parameter	ν	Khan and Thomas [2008, 2013]	0.84
Capital constraint	ζ	Kitao [2008]	1.50
Depreciation rate	δ	Stokey and Rebelo [1995]	0.06
Probability of being alive in $t+1$	χ	Average work life span	45.00

Table 2: External Calibration

4.2 Internal Calibration

Table 3 shows the remaining parameters, which are internally calibrated to match key moments of entrepreneurial behavior and firm 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 ϵ 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 firms.

Finally, the elasticity of substitution between entrepreneurial time and hired labor, ρ, is selected to replicate the empirical correlation between average employment and average hours across firms, implying strong complementarity between entrepreneurial hours input and hired labor.

Parameter	Symbol	Value	Target Moment	*Data*	*Model*
Discount factor	β	0.99	Capital–output ratio	*2.65*	*2.69*
Fixed cost of entry	f^e	0.00	Entry rate	*0.02*	*0.02*
Mean preference for leisure	μ_λ	0.11	Avg. entrepreneurial hours	*0.38*	*0.38*
Std. dev. preference for leisure	σ_λ	0.10	Std. dev. entr. hours	*0.12*	*0.20*
Mean entrepreneurial ability	μ_ϵ	0.34	Share of entrepreneurs	*0.06*	*0.06*
Std. dev. entrepreneurial ability	σ_ϵ	0.02	Std. dev. gross sales	*0.40*	*0.46*
Hours–labor complementarity	ρ	-2.20	Corr. of avg. n and avg. h	*0.90*	*0.99*

Table 3: Internal Calibration

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 firms, 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 firm 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.
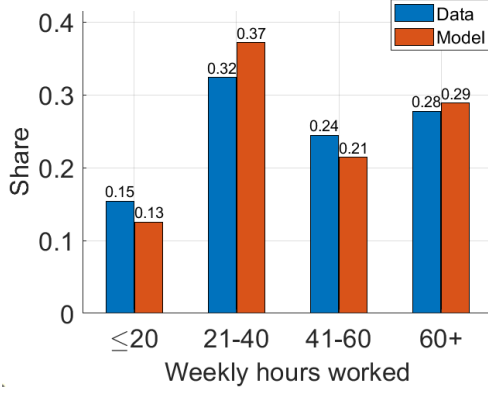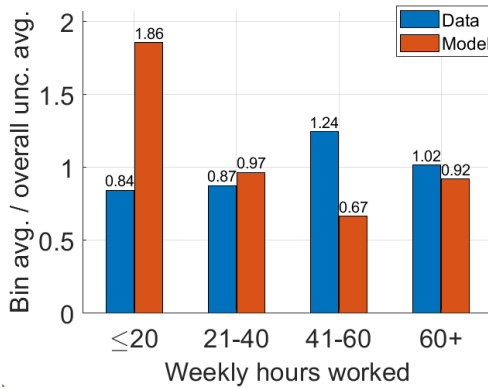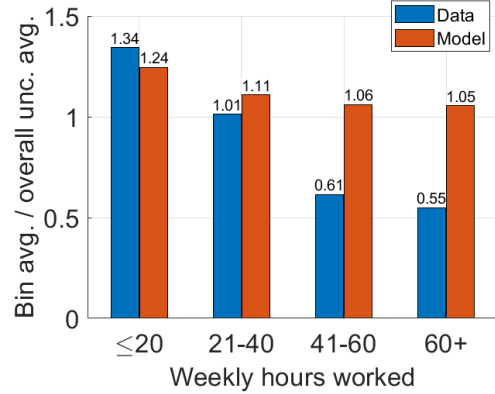
(a) Entrepreneur composition
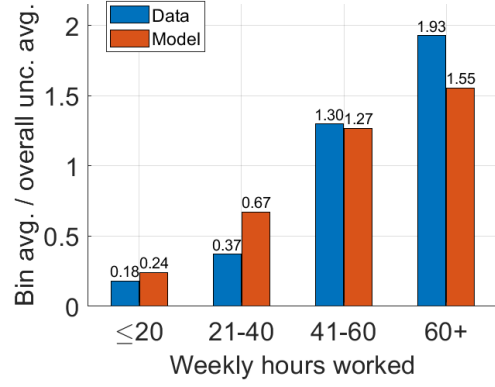
(b) Average employment
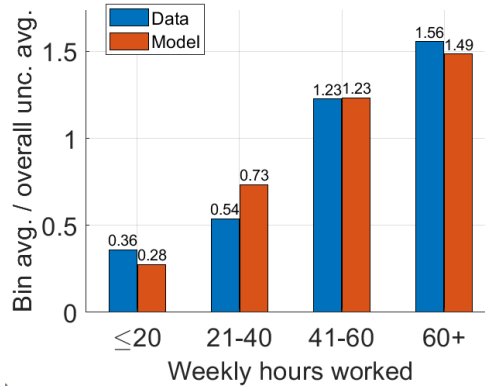
(c) Average sales

(d) Average assets

(e) Average profitability

Figure 5: Model and data across entrepreneurial hours bins

## 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

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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 twelve percent of entrepreneurs work fewer than twenty 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 two percent of entrepreneurs choose to work fewer than twenty 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.

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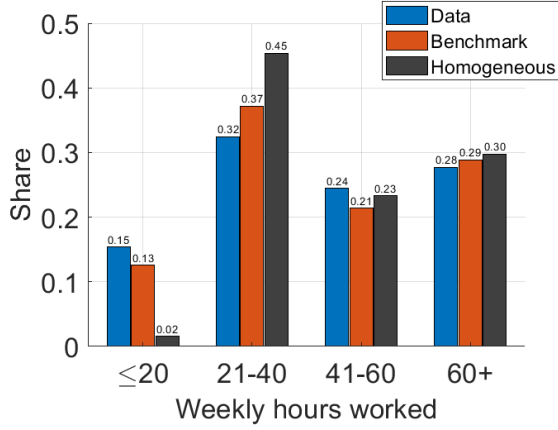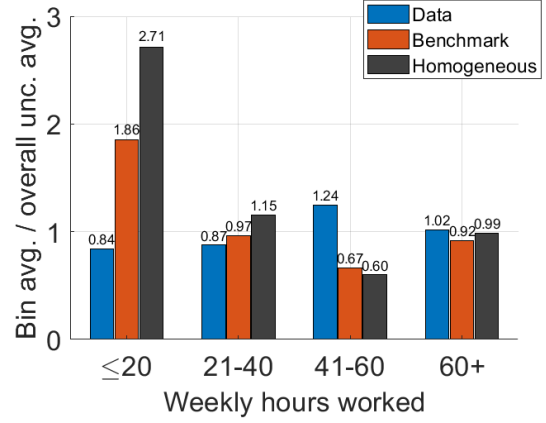
(a) Hours Categories	(b) Assets by Hours Group

5.3 Role of Entrepreneurial Hours-LaborComplementarity

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, entrepreneurship size increases with hours supplied, consistent with the empirical pattern

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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.

(a) Hours Categories
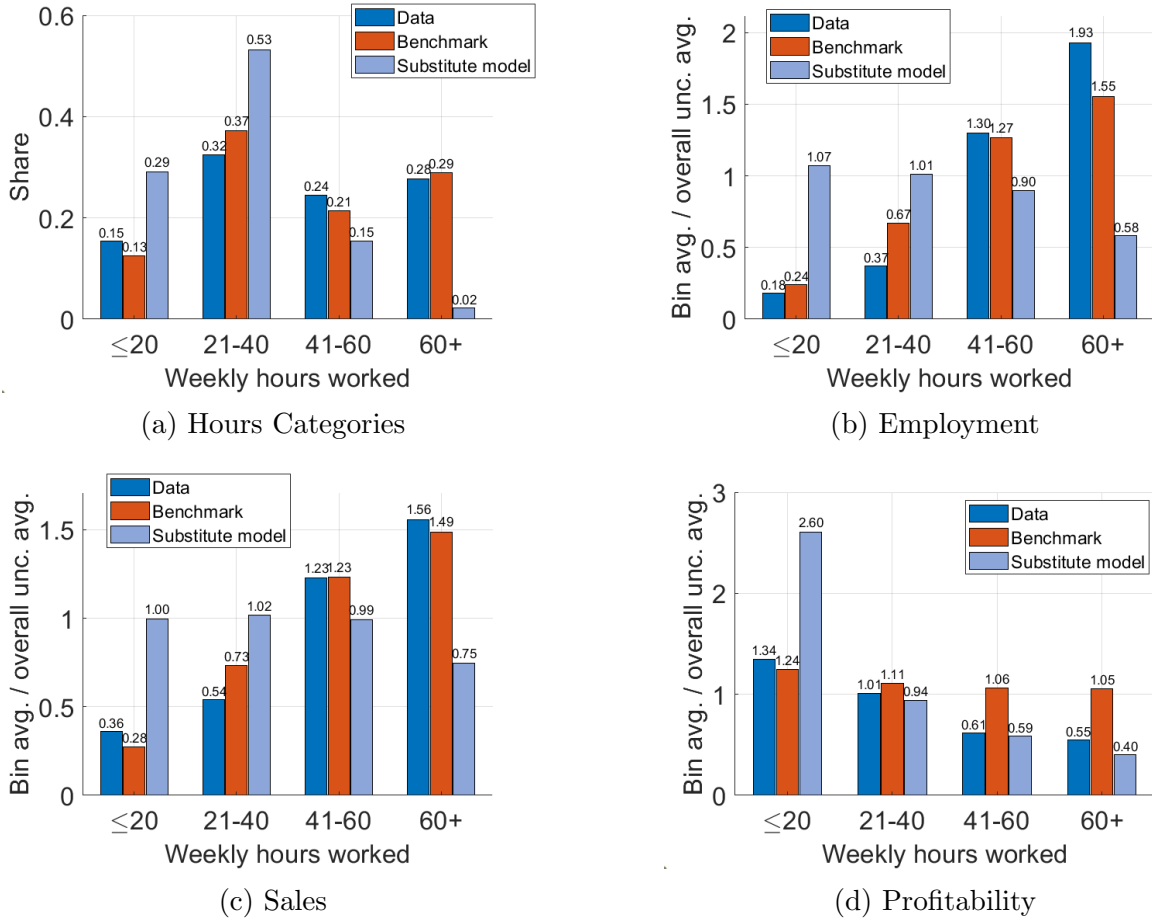
(b) Employment

(c) Sales

(d) Profitability

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

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 firms. 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 firms creates a profitability pattern that di-

verges 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, firm size, and returns.

6 Policy Experiment

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 expands 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 firms, and the policy generates large increases in borrowing, capital, and firm 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.

	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

Note: Welfare measured in partial equilibrium (holding prices & distribution fixed)

6.3 Welfare Effects Across Hours Group

Table 4 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 twenty-one to forty hours and forty-one to sixty hours, rising by 1.82 percent and 3.44 percent, respectively. Entrepreneurs who work fewer than twenty hours or more than sixty hours experience minimal improvements.

In the environment with homogeneous preferences, the response is substantially larger. Welfare gains exceed eleven 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 twenty 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.

Hours Group	Benchmark (%)	Homogeneous (%)
≤ 20	1.66	0.00
21–40	1.82	0.47
41–60	3.44	11.10
60+	1.58	1.92
Overall	**3.11**	**3.85**

Table 4: Compensating Variation Gains from Relaxing the Collateral Constraint

7 Conclusion

This paper has examined how heterogeneity in preferences for leisure shapes entrepreneurial decisions, firm outcomes, and the effectiveness of policies that relax borrowing constraints. Using microdata from the Survey of Consumer Finances, I documented three central empirical patterns: entrepreneurial hours are highly dispersed, hours are strongly related to firm size in both employment and sales, and hours co-move with business assets in ways 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 firm 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.

The paper 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 firm size, generating welfare gains exceeding eleven 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 twenty 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 firm 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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Appendix

A 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.
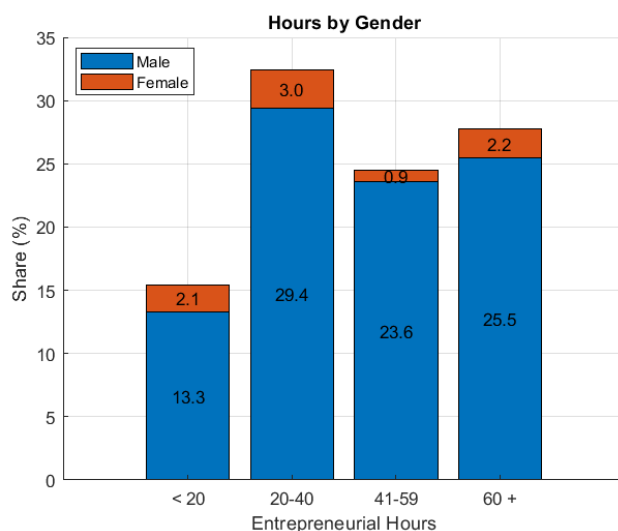
Figure 8: Entrepreneurial Hours Distribution by Gender

(a) All Entrepreneurs   (b) Less than 20 hours
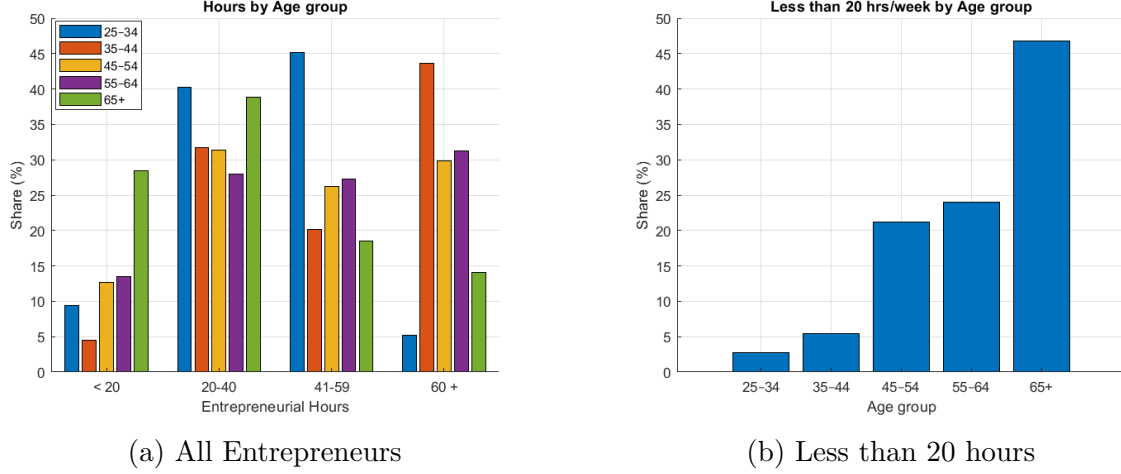
Figure 9: Distribution of Weekly Hours by Age

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.

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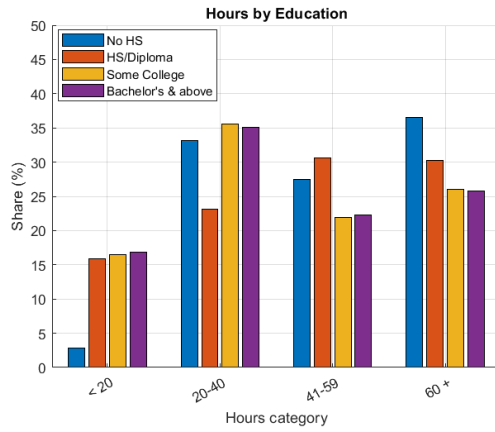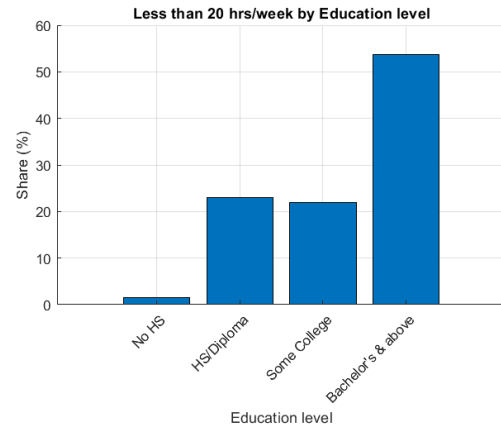
(a) All Entrepreneurs   (b) Less than 20 hours

Figure 10: Distribution of Weekly Hours by Education Level

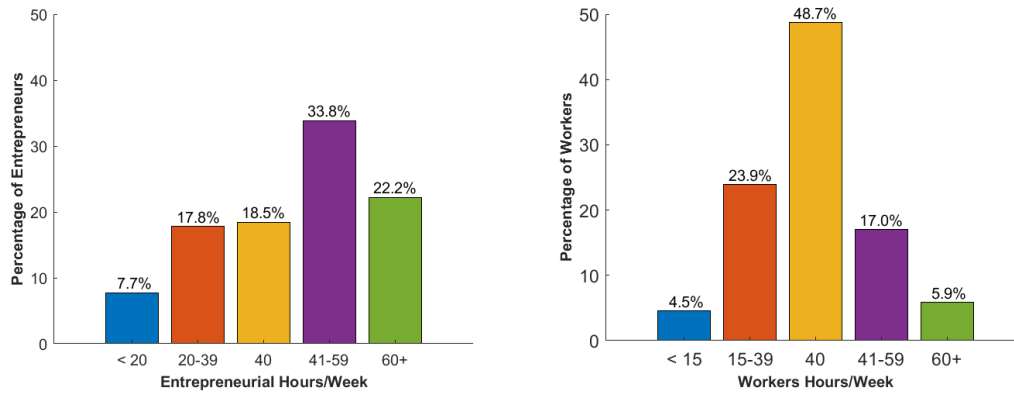# B   Empirical Evidence from alternative dataset: SBO

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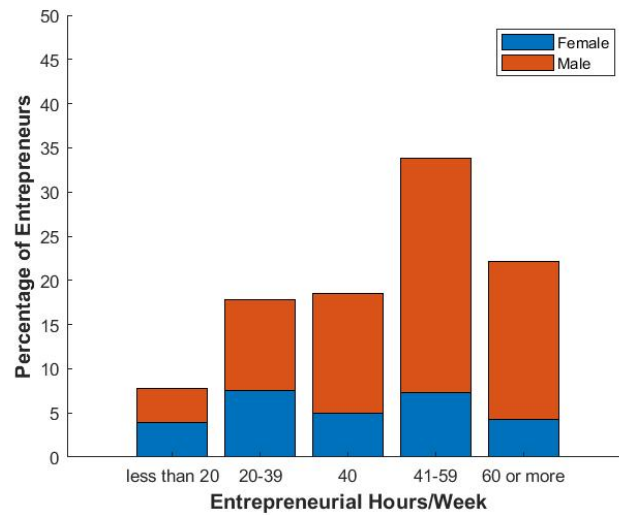
Gender

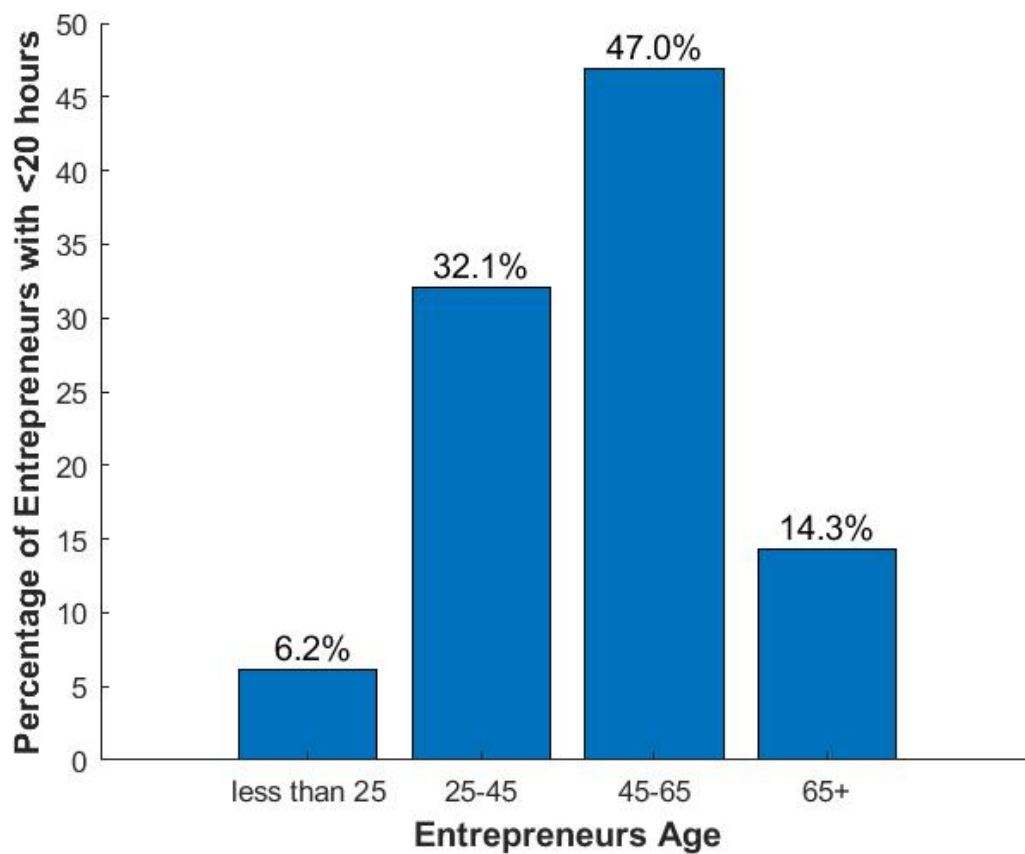Figure 12: Entrepreneurial Hours Distribution by Gender

Figure 13: Less than 20 hours

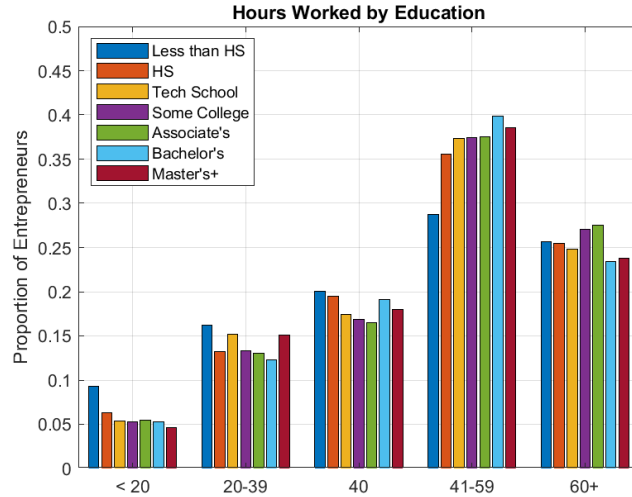Figure 14: Distribution of Weekly Hours by Age

Education

Figure 15: Entrepreneurial Hours Distribution by Education

Proportion of Entrepreneurs less than 20 Hrs	Education Level
10.2%	Less than High School
21.9%	High School
6.8%	Technical School
16.4%	Some College
5.4%	Associate's
23.1%	Bachelor's
15.7%	Master's+

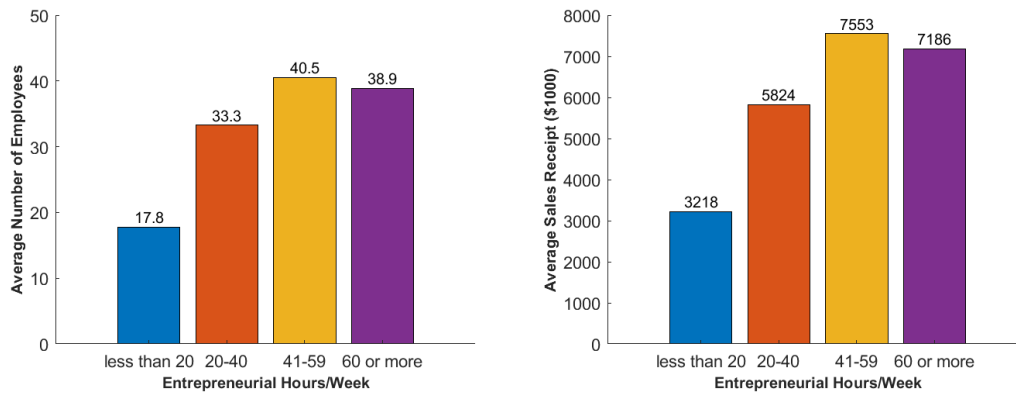Table 5: Proportion of Entrepreneurs Working Less Than 20 Hours by Education Level

Figure 16: Entrepreneurial Hours and Firm Size