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The reasons that younger homeowners are less likely to become entrepreneurs: The role of capital constraints

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ABSTRACT

Considering that housing is the single biggest asset for most households, owning a home may create barriers to entrepreneurship for young people who generally accumulate relatively little wealth due to a short-term career and low income. Using longitudinal data from the China Family Panel Studies (CFPS) survey, our empirical work suggests that homeowners are associated with significantly less propensity for entrepreneurial engagement and the negative homeownership effect on entrepreneurship is much larger for younger homeowners. These findings are robust to omitted variable bias, reverse causality and model misspecification. We explore the mechanism through which capital constraints related to housing purchase may more affect younger homeowners from starting entrepreneurial activities. We find strong supportive evidence for this mechanism.

KEYWORDS

Homeownership; Age; Entrepreneurship; Capital constraint

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1. Introduction

Given the importance of entrepreneurship in economic growth and social welfare (Acs et al. 2008; Carree and Thurik 2010), there is a considerable body of literature on the determinants of entrepreneurial engagement (Lu and Tao 2010). Since overcoming credit constraint in setting-up nascent businesses is the critical issue for most nascent entrepreneurs (Evans and Jovanovic 1989), and owner-occupied housing is the single biggest asset for most households (Chen et al. 2019), the relationship between household assets and the probability of being an entrepreneur deserves deep investigation. Extensive research has shown that young people are more likely to be entrepreneurs than other age groups and capital constraints could deter potential entrepreneurs to acquire necessary capital to start a business (Chen and Hu 2019; Li and Wu 2014). It is therefore important to explore the factors that impact the entrepreneurial choice of young people. This paper examines whether capital constraints related to housing purchase play an important role in affecting young people's engagement into entrepreneurship. Considering that owner-occupied housing is the single biggest asset for most households, we hypothesize that owning a home may create barriers to entrepreneurship for young people who generally accumulate relatively little wealth due to a short-term career and low income.

The present study contributes to the current literature in two main aspects. First, this paper investigates whether the association between entrepreneurship and homeownership varies across age groups. In general, homeownership is found to be negatively associated with entrepreneurship in China where the positive effect of homeownership dominates (Chen and Hu 2019; Li and Wu 2014), although some studies document a positive effect of homeowners on entrepreneurship (e.g., Lisi 2017, 2018, 2019). The present study, nonetheless, examines the relationship between homeownership and entrepreneurship from the perspective of age difference. Using data from China Family Panel Studies, we consistently find a significant difference in the homeownership-entrepreneurship relationship across age categories. Younger homeowners are associated with much lower likelihood of starting a business than older homeowners.

Second, this paper investigates the mechanism through which younger homeowners are more likely to be subject to liquidity constraints, which helps to a better understanding of the homeownership-entrepreneurship linkage. Homeownership acquisition consumes a lot of household liquid capital due to the high value of housing asset (Fang et al. 2016). In environments with an imperfect credit market, owning a home would therefore have a negative impact on the likelihood of being entrepreneurs from the perspective of capital constraints. This effect may be stronger for young people since they generally do not have enough time for wealth accumulation (Evans and Jovanovic 1989). In our analysis this mechanism is cross validated by two strategies, i.e., the heterogeneity of housing wealth effect on entrepreneurship across age groups and the heterogeneity relationship between homeownership and entrepreneurship for high-income households and others.

The remaining of this paper is structured as follows. Section 2 provides a brief literature review. Section 3 introduces the data and econometric methodologies as well as preliminary evidence. Section 4 reports the empirical results from basic models and robustness checks. The final section concludes this article with policy implications.

2. Literature

2.1. Determinants of entrepreneurship

There is a burgeoning literature on the determinants of entrepreneurship considering its significant contribution to innovation and economic prosperity. Simoes et al. (2016) sum up individual determinants of entrepreneurial engagement into seven aspects: basic individual characteristics, family background, personality characteristics, human capital, health condition, nationality and ethnicity, and access to financial resources. Djankov

et al. (2006) further suggest that the determinant factors of the entry into self-employment can be generally categorized into three categories. The first category refers to the economic, political, and formal/informal institutions shaping the decision to start an entrepreneurial activity. Economic and institutional factors are mainly reflected in credit constraints that hinder the entrepreneurial choice of individuals; imperfect property rights reduce the incentive for potential entrepreneurs to set up businesses; regulatory burdens make it more impossible to start new businesses. Incumbent monopolies that has in effect a great control over the government may prevent potential entrepreneurs from entering into the market through strict regulatory policies, and inefficient and rigid regulation may be a kind of "road toll" imposed by government officials (De Haan and Sturm 2000; Shleifer and Vishny 1993). Thus, unnecessary government regulation increases the investment cost of entrepreneurship that not only discourages entrepreneurial activities, but also leads to the inefficiency of resource allocation. In addition, as a social, historical and cultural phenomenon, religion can influence the investment behaviors of church members through the church culture (Audretsch et al. 2007; Nunziata and Rocco 2011).

The second category emphasizes the sociological variables and the most important one is social capital. In addition to material capital and human capital, social capital is also an important determinant of a family's entrepreneurial activity. The influence of social capital on entrepreneurship mainly works through an enlarged social network that consists of formal and informal connections between network members. It has been long suggested that most nascent entrepreneurs are deterred by credit constraints of start-up financing (Egger and Winner 2005; Evans and Leighton 1989). Saving and borrowing from friends, relatives and family members are important sources of start-up capital for entrepreneurs (Paulson and Townsend 2004; Zhang and Zhao 2015). These findings highlight the positive role of social network in entrepreneurship by easing credit constraints. Besides, social network helps to improve access to material resources and information, gain emotional support, and obtain the necessary licenses to operate (Fafchamps and Gubert 2007; Yao and Yueh 2009).

The third category emphasizes individual characteristics of entrepreneurs. Other than institutions and social networks, individual characteristics are also important factors influencing entrepreneurial engagement. First, entrepreneurial ability influences individual's entrepreneurial decision to a large extent. The entrepreneurial choice of individuals is mainly determined by their entrepreneurial ability and available entrepreneurial resources (Cagetti and De Nardi 2006; Evans and Jovanovic 1989). Since the person who lacks of entrepreneurial ability is completely excluded from the market, entrepreneurial ability is of great importance (Burke et al. 2002). Second, entrepreneurial knowledge, especially financial knowledge, is essential to entrepreneurial engagement since entrepreneurial decision is a process involving information collection, market analysis and resource integration (Mitchell et al. 2000). Financial knowledge is reflected in people's understanding of basic economic and financial concepts, and the ability to use that knowledge and other financial skills to manage financial resources effectively for a lifetime of financial well-being (Mitchell et al. 2000). If the potential entrepreneurs do not possess sufficient financial knowledge, they may not be able to properly arrange entrepreneurial resources, guard against investment risks, and ensure the sound operation of start-ups. Other individual characteristic factors, such as age, education attainment, marriage status, political background, household registration and family population, also have significant influence on individual entrepreneurial decision (Cagetti and De Nardi 2006; Yueh 2009; Zhang and Pan 2012).

2.2. Homeownership and entrepreneurship

Homeownership and housing wealth start to attract attention in current literature on entrepreneurship. Previous studies on entrepreneurship often find that homeownership has a negative effect on entrepreneurship and housing wealth appreciation helps to reduce the side effect of homeownership (Adelino et al. 2015; Chen and Hu 2019; Corradin and Popov 2015). Bracke et al. (2014) provide two possible mechanisms regarding to this finding.

First, home mortgage crowds out startups. House purchases are typically leveraged and mortgage debt may discourage entrepreneurial activities of homeowners (Hu et al. 2019). Second, capital constraint limits homeowners' entrepreneurial choice. Considering the high cost of buying a home and the low mortgage value of housing with a large number of housing mortgage loans, households after buying a home are less likely to embark upon entrepreneurship for insufficient start-up capital. Indeed, Bracke et al. (2014) find that individuals who become homeowners are about 25% less likely to become entrepreneurs, and a one standard deviation increase in leverage makes a homeowner 10-12 percent less likely to become an entrepreneur. The inhibition effect of homeownership on entrepreneurship could be especially conspicuous in China due to its soaring housing prices and underdeveloped financial markets.

Chen and Hu (2019) further categorize the mechanisms underlying why homeownership impacts entrepreneurship into four groups; these are collateral effect mechanism, wealth effect mechanism, lock-in effect mechanism, and crowding-out effect mechanism. First, collateral effect mechanism refers to the way that homeowners can use housing equity as collateral for business start-up loans. There is the vast significance and flexible potential of the collateral value of an owned home in easing credit constraints for venture financing. Second, as homeowners are, on average, wealthier than are renters, one can expect that they may place more value on self-actualization and, thus, have more zeal for engaging in entrepreneurship. This mechanism is named as "wealth effect". Third, individuals would opt for investment in housing, rather than in business ventures if housing investment yields higher returns than entrepreneurial investment, a situation that dampens people's entrepreneurial zeal. This is called "crowding-out effect". Fourth, given that homeownership is generally financed by leveraged mortgage, homeowners under loan repayment pressure will be more likely to be locked in their current jobs to ensure a stable cash flow and, thus, less likely to embark upon entrepreneurship. This mechanism is called "lock-in effect". Therefore, there are positive collateral effect and wealth effect, as well as negative crowding-out effect and lock-in effect as to the impact of homeownership on individual's entrepreneurial engagement. Chen and Hu (2019) find a negative impact of homeownership on entrepreneurship, suggesting the dominant role of negative effects.

2.3. The homeownership-entrepreneurship nexus across age categories

Most studies document a negative homeownership effect on the entry into entrepreneurship and find that younger people have more zeal for engaging in entrepreneurship (Chen and Hu 2019; Li and Wu 2014), while much less attention has been paid in the heterogeneity of the relationship between homeownership and entrepreneurship. Chen and Hu (2019) and Wang (2012) examine this heterogeneity from the ownership from different sources. This paper extends this strand of literature by investigating the homeownership-entrepreneurship nexus across age categories.

In a perfect credit market, there is no concern on insufficient capital since external financing is always available for accredited investors; while in an imperfect credit market with asymmetric information, liquidity shortage caused by credit constraints probably prompts investors to abandon their investment activities (Evans and Jovanovic 1989). Previous studies suggest that capital constraint is a key factor restricting individuals from undertaking entrepreneurial activities. For example, Evans and Jovanovic (1989) and Lerner and Schoar (2010) find that wealthier families who are less likely to suffer from capital constraint have higher probability of starting their own businesses. Using the data from the French Labor Force Statistics and local house prices for 25 regions from 1992 to 2002 in France, Schmalz et al. (2017) find that the aggregate-level firm creation is positively correlated with house prices in regions where the fraction of homeowners is larger. The main reason is that increase in collateral value leads to a higher probability of becoming an entrepreneur by the alleviation of capital constraint. Similar findings are reported in many studies, such as Adelino et al. (2015), Corradin and Popov (2015), Harding and

Rosenthal (2017) and Chen and Hu (2019).

Housing asset is the most important and valuable component of household wealth for most households. However, it is the high value of housing property that makes households invest a lot of money to obtain and maintain their homeownership. Entrepreneurial investment needs a lot of venture capital. Households who intend to engage into entrepreneurship may be forced to give up their entrepreneurial activities because of the shortage of venture capital after purchasing a home. The financial constraint caused by the acquisition of homeownership is even more pronounced in China where house prices have maintained high levels for many years. According to China Statistical Yearbook, the price per square meters in urban cities increased by 4,619 yuan from 1,854 yuan in 2004 to 6,473 in 2015. Soaring housing price leads to an increasing unaffordability of housing. The price-to-income ratio for the nation rose from 6.6 in 2003 to 8.1 in 2009 (Feng and Wu 2015).

The financial constraint caused by housing purchase in China is mainly reflected in two aspects: first, liquid capital of households who purchase a home is locked by housing due to a high down payment ratio. China has a high down-payment ratio as banks in China imposed down payments of over 30 percent on all mortgage loans, which is 2.4 to 3.2 times of the borrower's annual income (Fang et al. 2016); second, high monthly mortgage payments consume a substantial fraction of the household income, which makes an insufficient accumulation of household wealth. Fang et al. (2015) estimate that servicing the mortgage loan would consume 47% of the household's annual income. As housing prices continue to rise in recent years, the increasing burden of housing mortgage loan repayment prevents many households from entrepreneurial ventures (Li and Wu 2014).

For young people who accumulate relatively little wealth due to a short-term career and low income, the financial constraint related to homeownership acquisition is predicted to be stronger among them. In fact, young people are more risk-tolerant and gravitate toward risky ventures (Miller 1984), and also more likely to start a business (Chen and Hu 2019; Li and Wu 2014). However, many young people are hard to realize their entrepreneurial dream since they do not have enough time to build up or borrow enough capital needed to start a business in an environment with credit constraints (Evans and Jovanovic 1989). Therefore, homeownership acquisition that consumes a substantial fraction of the household liquidity capital would have a stronger negative influence on entrepreneurship for young people than that for other age categories.

3. Data and econometric methodology

3.1. The data source

Our empirical analysis is based on the China Family Panel Studies (CFPS henceforth) covering the years of 2010, 2012 and 2014. This program is funded by the 985 Program of Peking University, carried out by the Institute of Social Science Survey (ISSS) of Peking University, and is supported by several of China's official organizations. CFPS is a nationally representative household survey that interviewed roughly 15,000 households in 25 mainland provinces or their administrative equivalents (municipalities and autonomous regions) in China.

Multistage probability proportional to size sampling (PPS) with implicit stratification is used for a better representation of Chinese society. More details about the CFPS can be found at its official website and in the academic research of Xie and Hu (2014).

We apply several screenings to the sample. First, CFPS conducts in both urban and rural regions, but the sample used in this analysis is limited to the urban areas since housing in rural China has encumbered ownership and is only tradable within collectives (Ho 2017). Second, this paper focuses on the labor choice of individuals, so we limit the sample to working age adults between 20 and 60 years old in 2010. Third, similar to Wang (2012), we restrict our attention to household heads and spouses of heads who generally possess the private property rights.

After eliminating the observations with missing values of key variables, the sample of the three-year panel

dataset employed in the econometric model covers 7,455 individuals.

The dependent variable in our analysis is an indicator of entrepreneur at the household level, which equals one if there is at least one family members engaging in entrepreneurship engagement, including individually operated business or private enterprises; and equals zero otherwise. Based on this definition, the fraction of entrepreneurs is around 14.5% of the sample population. Of primary interest is the indicator variable of homeowner. The percentage of homeowners is as high as 84.5% in the sample. Other variables from the CFPS used in the analysis are also summarized in Table 1.

Table 1. Summary statistics.

Variable	Mean	Std. Dev.
Entrepreneur	0.145	0.341
Homeowner	0.845	0.362
Home equity	38.99	52.46
Female	0.491	0.500
Age	46.12	9.893
Primary school	0.207	0.405
Middle & high school	0.552	0.497
3-year college	0.149	0.356
4-year college and above	0.093	0.290
Urban hukou	0.496	0.500
Han nationality	0.957	0.204
Communist	0.324	0.468
Married	0.845	0.362
Household income	49,820	49,633
Observations		22,365

Data source: CFPS 2010, 2012 and 2014.

3.2. Correlations between homeownership and entrepreneurship

Based on the CFPS data, we calculate the fraction of entrepreneurs for households with different types of housing tenures to sketch a general relationship between homeownership and entrepreneurship. Figure 1 shows that the average entrepreneurship rate is 14.55% for the full sample; the fraction of entrepreneurs for homeowners is 13.74%, while that for renters is as high as 18.94%. This evidence indicates that a household's entrepreneurial engagement is negatively associated with homeownership acquisition. We also divide homeowners into younger and older groups and compare the entrepreneurship rate of homeowners and renters in each group. Two interesting findings can be found in the compared results, as presented in Figure 2. First, younger homeowners (renters) have higher probability of becoming entrepreneurs than older homeowners (renters). Second, owning a home makes younger homeowners (renters) much less likely to engage into entrepreneurship relative to their older counterparts. The difference in entrepreneurship rate between younger homeowners and younger renters is 10.32% (26.27% - 15.95% = 10.32%), while the difference between older homeowners and older renters is only 1.81% (14.86% - 13.05 = 1.81%). This finding suggests that younger people are more vulnerable to the homeownership acquisition compared with older people in terms of entrepreneurial engagement.

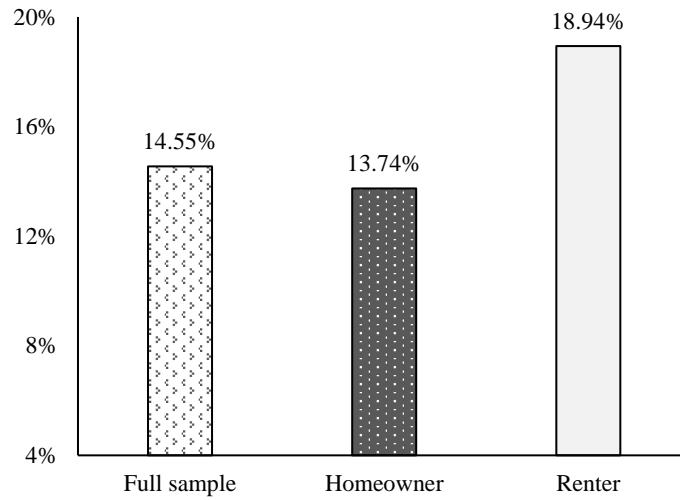


Figure 1. Homeownership and entrepreneurship.

Data source: CFPS 2010, 2012, 2014.

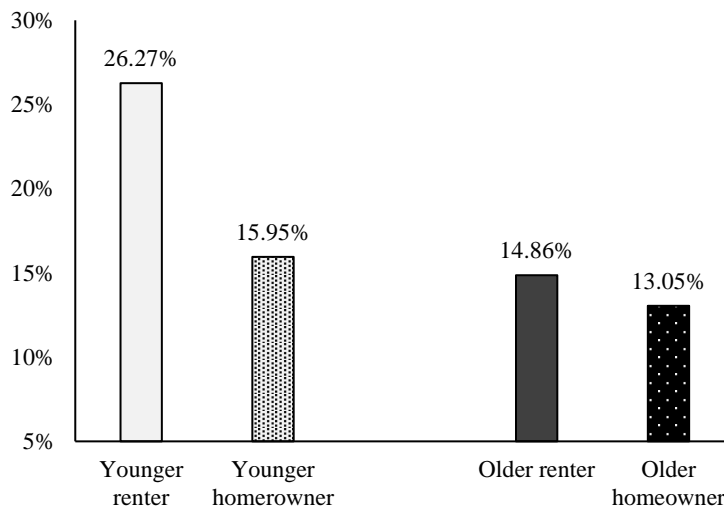


Figure 2. Homeownership and entrepreneurship: age difference.

Data source: CFPS 2010, 2012, 2014.

3.3. Econometric methodology

Since entrepreneurial decision is a binary outcome, we use the standard probit model to estimate whether homeownership can affect household’s entry into entrepreneurship. The structure of the probit model has the following format:

$$Entrepreneur_{ijt} = \beta_{0,1} + \beta_{1,1}Homeowner_{ijt} + \delta_1X_{ijt} + \gamma_j + \varphi_t + \varepsilon_{ijt} \tag{1}$$

where $Entrepreneur_{ijt}$ is an indicator variable of entrepreneurs, which equals to one if household i ’s occupation status is “self-employed or private entrepreneur” in district j and year t , and equals to zero otherwise. It is a function of homeownership ($Homeowner_{ijt}$), control variables (X_{ij}), year dummies (φ_t), district dummies (γ_j) and error term (ε_{ijt}). X_{ijt} is a vector of control variables, including household head’s gender, age, education, hukou, nationality, political status, marriage status and household income. To further explore whether the association

between homeownership and entrepreneurship varies across age groups, we re-estimate regression Equation (1) in each subsample of younger and older people.

4. Empirical findings

4.1. Homeownership and entrepreneurship

We first estimate the specification by controlling for homeownership and other covariates to examine their effects on entrepreneurship. The estimated coefficients, standard errors, marginal effects and significance levels are reported in column (1) of Table 2. The results indicate that, after controlling for other observables and year and district dummies, homeowners are on average associated with roughly 5.4 percentage points' lower propensity of either engaging in self-employment or starting their own business than are comparable renters¹. The difference in propensity is significant at the 1% level. Such a finding is in line with previous literature on the negative homeownership effect on entrepreneurship in China (Chen and Hu 2019; Li and Wu 2014). The coefficients of other control variables in Table 2 are as expected by economic theory and are consistent with findings in most previous literature.

We now further investigate whether this relationship varies across age categories. We run the regression from Equation (1) in the sample of younger and older people and the results are presented in the column (2) and column (3) of Table 2, respectively. The results suggest that the negative homeownership effect is indeed larger on younger homeowners compared with their older counterparts. Younger homeowners are associated with 8.4 percentage points lower likelihood of starting a business than comparable renters, while older homeowners are associated with 3.7 percentage points smaller likelihood, holding other things constant.

Table 2. Homeownership and entrepreneurship.

	(1)		(2)		(3)	
	Full sample		Younger homeowner		Older homeowner	
	Coef.	Marginal effect	Coef.	Marginal effect	Coef.	Marginal effect
Homeowner	-0.229*** (0.030)	-0.054***	-0.302*** (0.051)	-0.084***	-0.173*** (0.039)	-0.037***
Female	-0.059*** (0.022)	-0.013***	-0.084** (0.042)	-0.022**	-0.059** (0.026)	-0.012**
Age	0.041*** (0.009)	0.009***	-0.094 (0.057)	-0.024	0.078** (0.034)	0.015**
Age squared	-0.001*** (0.000)	-0.000***	0.001 (0.001)	0.000	-0.001*** (0.000)	-0.000***
Education						
Primary school and below (ref.)						
Middle & high school	0.132*** (0.032)	0.028***	0.191*** (0.072)	0.049***	0.124*** (0.036)	0.024***
3-year college	-0.098** (0.049)	-0.021**	0.063 (0.095)	0.017	-0.147** (0.060)	-0.027**
4-year college	0.008 (0.054)	0.002	0.057 (0.100)	0.015	0.024 (0.068)	0.005
Urban hukou	-0.269*** (0.029)	-0.058***	-0.371*** (0.051)	-0.096***	-0.222*** (0.036)	-0.044***

¹ Chen and Hu (2019) have tangentially touched on the heterogeneity relationship between homeownership from different sources and entrepreneurship. We do not differentiate the heterogeneous effects of homeownership on entrepreneurship from the perspective of property right heterogeneity, which is worth further study.

Han	0.043 (0.065)	0.009	0.324*** (0.122)	0.072***	-0.083 (0.077)	-0.017
Communist	-0.054 (0.035)	-0.012	-0.182*** (0.069)	-0.045***	-0.007 (0.042)	-0.001
Married	0.210*** (0.033)	0.042***	0.310*** (0.060)	0.073***	0.187*** (0.041)	0.034***
Ln(Household income)	0.036*** (0.007)	0.008***	0.023* (0.013)	0.006*	0.042*** (0.009)	0.008***
Year dummies	Yes		Yes		Yes	
District dummies	Yes		Yes		Yes	
R-squared	0.1135		0.1449		0.1219	
Observations	22,365		5,750		16,615	

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.2. Robustness checks

In this section we use multiple specifications to test whether findings from the basic model are robust after controlling for i) omitted variable bias, ii) function misspecification, and iii) reversal causality.

4.2.1. Omitted variable bias

Using district dummies can control time-invariant regional features that could impact individual's entry into entrepreneurship. However, endogenous bias may still exist for the existence of unobserved individual characteristics, such as entrepreneurial ability and investment preference, that have important influence on individual entrepreneurial choice. Taking this into consideration, we use individual-level panel model to get around the concern on the potential omitted variable bias. Since most observations are deleted from the panel probit model in our sample and the corresponding regression results may be not valid, we choose the panel ordinary least squares model. The linear probability model has the problem of heteroscedasticity, but the estimated effects obtained by using the robust standard error are still unbiased (Wooldridge 2015).

Results based on the fixed-effects model are presented in Table 3. We can see that the results after controlling for unobserved heterogeneity of individuals remain consistent with the previous estimations. In comparison with renters, homeowners are 1.7 percentage points less likely to start their own business, and the negative homeownership effect on entrepreneurship is more prominent for younger homeowners than their older counterparts.

Table 3. Homeownership and entrepreneurship: fixed-effects model.

	(1)	(2)	(3)
	Full sample	Younger homeowner	Older homeowner
	Coef.	Coef.	Coef.
Homeowner	-0.017** (0.008)	-0.029* (0.017)	-0.009 (0.009)
Control variables	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
District dummies	Yes	Yes	Yes
R-squared	0.0062	0.0076	0.0072
Observations	22,365	5,750	16,615

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; control variables include gender, age, education, hukou, nationality, political status, marriage status and household income.

4.2.2. Function misspecification

A key identification assumption of the basic model is that all the covariates have linear impacts on the dependent variable. If the relation between the dependent variable and the independent variables is non-linear, our previous estimators may be biased. To mitigate this concern, we apply the propensity score matching (PSM) approach, the identification of which estimates a propensity score for all individuals based on the “distance” between treatment and control groups. This method does not depend on the assumption of linear impacts of covariates.

Table 4. Homeownership and entrepreneurship: PSM.

	(1)	(2)	(3)
	Full sample	Younger homeowner	Older homeowner
	Coef.	Coef.	Coef.
Homeowner	-0.050*** (0.007)	-0.095*** (0.013)	-0.029*** (0.008)
Control variables	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
District dummies	Yes	Yes	Yes
Observations	22,365	5,750	16,615

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; control variables include gender, age, education, hukou, nationality, political status, marriage status and household income.

In the PSM estimation for the homeownership effect on entrepreneurship, we match homeowners with renters by using the kernel matching algorithm to find all matched pairs that have closest propensity score. The Average Treatment effect on the Treated (ATT), which has a similar interpretation to the marginal effect in the probit models that measures the difference in probability of being an entrepreneur between homeowners and renters, is then estimated using the sub-sample of matched samples. The estimation results of PSM approach are reported in Table 4. The estimated ATTs in all groups are consistent with our previous estimations. Compared to the renters, homeowners are associated with a lower rate of entrepreneurial engagement, holding other things constant. Besides, younger homeowners have less probability of becoming entrepreneurs relative to older homeowners.

4.2.3. Reversal causality

Time-invariant individual characteristics are controlled in the fixed-effects model, but the potential endogeneity of homeownership in previous estimations may still exist for the reverse causality. This problem arises when entrepreneurs have a different willingness to purchase a home compared with non-entrepreneurs. In this case, previous estimated coefficients could be biased. To address this concern, we use the district-level homeownership rate and housing price to income ratio to instrument for homeownership. These two instrument variables should be valid. On one hand, the regional homeownership rate and housing unaffordability are highly correlated with individual homeownership. First, regional characteristics may impact individual's location and homeownership choice decisions by interactions between neighborhoods (Gabriel 2003). People are more likely to purchase houses in a region characterized with high homeownership rate by peer pressure. Second, increasing housing unaffordability decreases the probability of homeownership. The issue of housing unaffordability in China's superstar cities is especially serious with housing price soaring in the past decades (Chen et al. 2019). On the other hand, the aggregate homeownership rate and housing price is not directly correlated with individual's owning decision.

Results from the two-stage least squares (2SLS) models are reported in Table 5. We can see that after controlling for potential reverse causality between homeownership and entrepreneurship, homeowners are 4.8 percentage points less likely to enter into entrepreneurship. Besides, younger homeowners are correlated with much lower chances of entry into entrepreneurship, while the negative homeownership effect is not obvious for

older homeowners. These results reinforce our previous findings.

Table 5. Homeownership and entrepreneurship: 2SLS.

	(1)	(2)	(3)
	Full sample	Younger homeowner	Older homeowner
	Coef.	Coef.	Coef.
Homeowner	-0.048*** (0.016)	-0.160*** (0.031)	0.010 (0.019)
Control variables	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
District dummies	Yes	Yes	Yes
R-squared	0.0275	0.0301	0.0233
Observations	22,365	5,750	16,615

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; control variables include gender, age, education, hukou, nationality, political status, marriage status and household income.

4.3. Why the negative homeownership effect is stronger on younger households?

In this section, we specify the mechanism of capital constraint underlying why the negative homeownership effect is stronger for younger homeowners in our previous estimations. We use two strategies to cross validate this mechanism: (i) the heterogeneity of housing wealth effect on entrepreneurship across age groups, and (ii) the heterogeneity relationship between homeownership and entrepreneurship for high-income households and others.

4.3.1. Housing wealth effect

Having access to adequate capital is critical for entrepreneurship in an imperfect credit market. There is ample empirical evidence showing a positive relationship between individual assets and the likelihood of starting a business (Djankov et al. 2006; Paulson and Townsend 2004). Housing is one of the most important physical assets for households and, thus, owning private property is expected to be critically helpful for individuals to start up their business ventures. Column (1) of Table 6 shows regression results by adding the interaction of $Homeowner_{ijt} \times Home\ equity_{ijt}$ into Equation (1). We can see that the coefficient of this interaction term is positive and statistically significant at the 1% level, indicating that homeowners are more prone to business undertakings with the appreciation of their housing assets.

Table 6. Housing wealth and entrepreneurship: age difference.

	(1)		(2)		(3)	
	Full sample		Younger homeowner		Older homeowner	
	Coef.	Marginal effect	Coef.	Marginal effect	Coef.	Marginal effect
Homeowner	-0.812*** (0.058)	-0.229***	-0.917*** (0.120)	-0.288***	-0.748*** (0.069)	-0.198***
Homeowner * Home equity	0.185*** (0.015)	0.039***	0.195*** (0.032)	0.050***	0.180*** (0.017)	0.035***
Control variables	Yes		Yes		Yes	
District dummies	Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes	
R-squared	0.1229		0.1486		0.1323	
Observations	22,365		5,750		16,615	

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; control variables include gender, age, education,

hukou, nationality, political status, marriage status and household income.

In order to examine whether the housing wealth effect varies across age groups, we divide homeowners into younger and older subsets. The estimated coefficients for the interaction of homeowner and home equity variable, as shown in column (2) and (3) of Table 6, suggest that the magnitude of household wealth effect on entrepreneurship is stronger for the younger homeowners compared with older homeowners.

4.3.2. Household wealth effect

Our empirical Similar to housing wealth, household wealth may also have a positive effect on the entry into entrepreneurship by alleviating the financial constraints of homeowners when embarking on entrepreneurial activities. Since we are particularly interested in the potential influence of household wealth effect on entrepreneurial decision of younger homeowners, we exclude the samples of older individuals. CFPS does not report household wealth, but it incorporates information on household income that is highly correlated with household wealth. Hence, we categories younger homeowners into two groups: wealthy households whose household income is above the 90th percentile and ordinary households whose household income is below the 90th percentile. With the rental category set as the reference group, column (1) and (2) of Table 7 present the estimation results based on these two groups, respectively.

Table 7. Household wealth and entrepreneurship: age difference.

	(1)		(2)	
	Younger homeowner whose household income is above the 90th percentile		Younger homeowner whose household income is below the 90th percentile	
	Coef.	Marginal effect	Coef.	Marginal effect
Homeowner	-0.178 (0.205)	-0.067	-0.294*** (0.055)	-0.079***
Control variables	Yes		Yes	
District dummies	Yes		Yes	
Year dummies	Yes		Yes	
R-squared	0.1965		0.1540	
Observations	639		5,111	

*Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; control variables include gender, age, education, hukou, nationality, political status, marriage status and household income.*

The regression results in columns (1) and (2) indicate that the negative effect of homeownership on younger people's entrepreneurship decreases with the increase of household income. Specifically, younger homeowners whose household income is below the 90th percentile are 7.9 percentage points less likely to start their own business than are comparable renters, while the negative homeownership effect is not significant for younger homeowner whose household income is above the 90th percentile. Such findings are in line with previous results that show the significant role of capital constraints in entrepreneurship among the young.

5. Conclusions

Previous studies focus on the general relationship between homeownership and entrepreneurship. Chen and Hu (2019) and Wang (2012) examine the heterogeneity relationship between the two from the ownership with different sources. This paper extends the literature by investigating the heterogeneity of homeownership effect on entrepreneurship across age categories. We also investigate mechanisms through which capital constraints related to housing purchase may more affect younger homeowners from starting new business ventures.

In consistent with previous results, we find a negative relation between homeownership and entrepreneurship in China by using longitudinal data from the China Family Panel Studies (CFPS) survey over the periods of 2010, 2012 and 2014. Homeowners are on average associated with roughly 5.4 percentage points' lower propensity of either engaging in self-employment or starting their own business than are comparable renters. The difference in propensity is significant at the 1% level. Moreover, we find that the negative homeownership effect on entrepreneurship is much larger for younger homeowners. Younger homeowners are associated with 8.4 percentage points lower likelihood of starting a business than are comparable renters, while older homeowners are associated with 3.7 percentage points smaller likelihood, holding other things constant. The mechanism of capital constraints underlying why the negative homeownership effect is stronger for younger homeowners is further well specified by using two strategies. By examining the mechanism through which capital constraints related to housing purchase may more affect younger homeowners from starting new business ventures, our study helps to a better understanding of the homeownership-entrepreneurship linkage.

Considering the long-lasting high level and high increase rate of housing price in China, entrepreneurship is not available for most young people since they usually have short working experience and low income. Purchasing a home may consume most of or even exhaust the savings of young people, and thus dramatically decrease the possibility of entering into entrepreneurship on account of insufficient start-up capital. However, younger people have higher entrepreneurial enthusiasm than older people (Chen and Hu 2019; Li and Wu 2014; Liang et al. 2018). These findings suggest that it is necessary to ease the capital constraints that could be confronted by younger homeowners to promote entrepreneurship and economic growth. Policymakers can attempt to innovate the housing finance system and venturing finance system to alleviate the financial constraint of young people in respect of starting their own business.

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Conflict of interest

The author claims that the manuscript is completely original. The author also declares no conflict of interest.

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