Do social interactions foster household entrepreneurship? Evidence from online and offline data from China Family Panel Studies

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A R T I C L E   I N F O

A B S T R A C T

Using China Family Panel Studies data, we analyze online and offline social interactions' influence on household entrepreneurial choice. We conclude that social interactions can positively influence household entrepreneurial choice, intensity and performance, and our findings are robust considering the possible endogeneity problem. The mechanisms of information acquisition, financing constraints relaxing and relative wealth concern are valid. In terms of heterogeneity analysis, for entrepreneurs of rural migrant backgrounds (those with agricultural *hukou* and urban permanent residence), the impact of online social interaction is more significant than it is for others. For households in the eastern regions, social interactions show significant positive impacts on entrepreneurship choices. We also find that the promotion effect of social interactions is more pronounced for households with a higher debt level than for those with a lower debt level.

1. Introduction

In recent years, China's economy has maintained steady growth, and its citizens' quality of life has constantly improved. In 2015, the Chinese government implemented the policy of "mass entrepreneurship and innovation", creating a favorable environment for households, calling on and promoting Chinese people to participate in a wave of entrepreneurship. According to the global report of StartupBlink, in 2021, China's entrepreneurship ecosystem index ranks 2nd in Asia and 10th out of 100 major economies. The 2021 Annual Report on corporate development in China shows that the number of newly established market entities (i.e., companies, individually owned businesses, and farmer cooperatives) increased by 15.4%, from 11.32 million in 2013 to 28.87 million in 2021. Over 96.7 million individual-owned businesses have direct participation; that is to say, more and more individuals and households are choosing to start their own businesses. At the same time, with the popularity of the Internet and smartphones, people's means of socializing become more diversified. China has 1.032 billion netizens, of whom 1.029 billion access the Internet via mobile phones, and the Internet penetration rate in China had reached 73.0% by the end of 2021.[1] Fig. 1 shows the development of the Internet from 2012 to 2021. The popularity of the Internet and smartphones facilitated people's online social interaction and smoothed the exchange of information between them. However, Chinese people are still highly active in traditional, face-to-face social activities. As shown in a
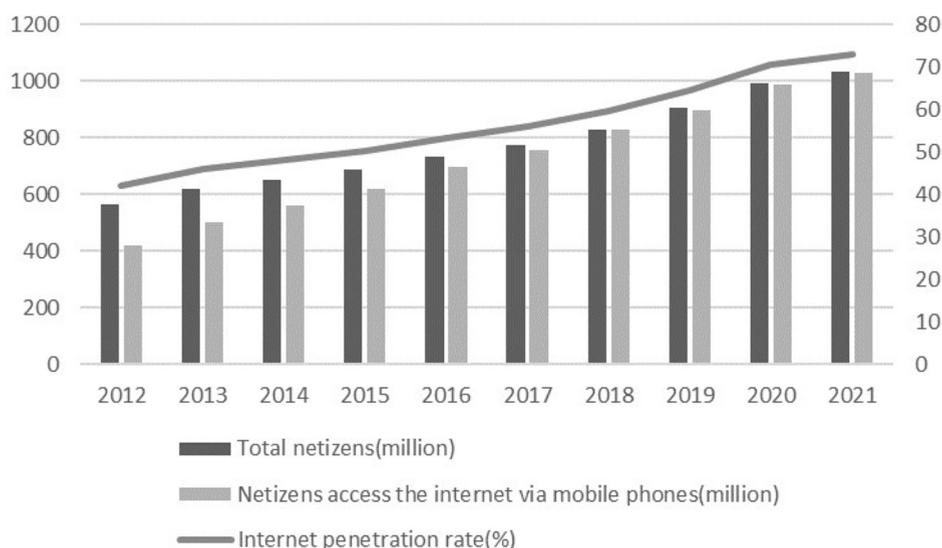

Fig. 1. Internet development in China (2012−2021).

report released by Tencent on the wages of Chinese people, the proportion of salary spent on human relationships reached 14.65%. Based on this background information, we will address the following questions: Is household entrepreneurship driven by social interactions? How do online and offline social interactions work? Which one contributes more?

Using China Family Panel Studies (CFPS hereinafter) questionnaires published by Peking University in 2014, 2016, and 2018, we conduct an empirical study on whether and how social interactions impact household entrepreneurial choices. Our baseline model shows the relationship between social interactions and household entrepreneurial choices. We then examine three possible influencing mechanisms—information acquisition, financing constraints relaxing and relative wealth concern—and find they are effective. We further discuss the impact of social interactions on entrepreneurship for households with different start-up intensities and performances. In addition, we conduct heterogeneity analysis according to different *hukou* (household registrations), different regions, and different household debt levels. To address the possible endogeneity problem, we employ the instrumental variable method to show that our results are robust.

Our findings may contribute to the extant literature in several ways. First, we propose and verify the potential complementary relationship between online and offline social interactions to foster household entrepreneurship. Compared with previous studies in which only one form of social interaction is considered, we show that the synergy between them may be helpful for entrepreneurship. In other words, the impact of both online and offline social interactions is taken into consideration, which is more in line with reality. Second, we use panel data instead of single-year data to ensure more reliable results. Third, we improve the selection and construction of some variable indicators to improve the credibility of the regression results. Compared with earlier literature that does not clearly distinguish between household-level and individual-level variables, the empirical part of our research is made consistent with the topic by selecting and constructing household-level variables. Fourth, we find that the promotion effect of social interactions is more significant for migrant resident households. In previous studies, scholars pay more attention to heterogeneity analysis from the aspect of urban and rural residents, neglecting households with rural hukou but living in urban areas.

The remainder of this study is organized as follows: We first review the relevant literature in Section 2 and then propose research hypotheses in Section 3. Section 4 describes our empirical analysis design, which includes data sources, data selection, processing, and a basic introduction to the baseline model. Section 5 covers the empirical test results, including the regression results of the baseline model, further discussion, discussion of endogeneity, mechanism analysis, and heterogeneity analysis. Section 6 presents the conclusion and shortcomings of the study.

2. Literature review

In this part, we review and summarize existing research from two aspects: factors influencing entrepreneurship and the impacts of social interactions on entrepreneurship.

2.1. Influencing factors of entrepreneurial behavior

The literature regarding the influencing factors of entrepreneurial behavior is mainly divided into two perspectives: personal and family characteristics at the micro level and institutional environment at the macro level. Personal and family characteristics include factors such as personal risk appetite, education level, personal beliefs, initial family wealth level and family background (Cumming & Johan, 2010). The institutional environment includes infrastructure, government regulation, financial availability, economic

conditions, and Internet popularity.

2.1.1. Individual characteristics

As the core of entrepreneurial willingness, entrepreneurs' personal characteristics are considered to be the primary factors affecting their entrepreneurial behaviors. They include risk preference (Parker, 1996; Wang, Zhang, & Liu, 2015), gender (Rosenthal & Strange, 2012) and human capital (Dias & McDermott, 2006; Dong, Sun, & Wu, 2019; He, 2022; Liu, 2008). Religious beliefs (Ruan, Zheng, & Liu, 2014) can also influence an individual's motivation to start a business. Van Praag and Cramer (2001) investigate the impact of risk attitude on entrepreneurship and find that taking risks plays a positive role in the success of enterprises.

2.1.2. Family background

Family background plays a key role in the process of entrepreneurship in individual and household-level research. Children may directly inherit their parents' entrepreneurial projects (Fairlie & Robb, 2007). The family entrepreneurial atmosphere also influences children imperceptibly. Djankov, Qian, Roland, and Zhuravskaya (2006) find that Chinese entrepreneurs are more likely to get support from family members or childhood friends who are entrepreneurs in the start-up process. Based on data from the Chinese Household Survey, Jia and Lan (2014) find that children's entrepreneurial behavior is influenced by their parents' political background, which contributes to the establishment of a broad social network and access to more business opportunities.

2.1.3. Social environment

In terms of social environment, macro environment characteristics such as regional economic development level, infrastructure construction, financial availability and rules and regulations are also key factors affecting entrepreneurial behavior (Chen, 2015; Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2002; Ghani, Kerr, & O'Connell, 2013; Glaeser & Kerr, 2009). Financing constraint is one of the obstacles commonly faced by entrepreneurs in various countries; thus, scholars often focus their research on this. Based on the Panel Study of Income Dynamics, Buera (2009) demonstrates that credit constraints do exist and those household entrepreneurial choices are non-linear in relation to wealth. Schmalz, Sraer, and Thesmar (2014) believe that entrepreneurial activities are negatively affected by collateral restrictions, and the increase of collateral value, such as through the purchase of a house, will not only enhance the possibility and probability of success of potential entrepreneurs to engage in entrepreneurship, but also increase the scale of entrepreneurial enterprises. The inhibitory effect of financing constraints on entrepreneurial activities has been confirmed (Weng & Zhang, 2015). Xu and Ma (2022) examine the relationship between the social credit system and entrepreneurship. The development of digital finance has also been shown to have positive effects on household entrepreneurship (Yang & Ma, 2022; Zhang & Shi, 2019).

2.2. The impact of social interaction on entrepreneurship

In addition to the social environment, individual characteristics, and family background, recent studies find that social interaction also has significant impacts on household entrepreneurial decisions. This is because household entrepreneurship is not only a family economic phenomenon, but also a behavior highly related to social interaction. Furthermore, social interaction is generally present throughout the entire entrepreneurship process in which the budget constraints, expectations and preferences of decision-makers are affected by others (Manski, 2000).

Scholars find that in individual-centered social networks, relatives, and friends, as the nearest outlets to individuals, will offer help in terms of customer information, financing and business operation. Therefore, the wider the social impact, the higher the probability that an individual will choose to start a business (Allen, 2000; Welsh, Llanos-Contreras, Alonso-Dos-Santos, & Kaciak, 2021; Yueh, 2009; Zhang & Zhao, 2015). The success of an entrepreneur depends on the quality and amount of information they can access (Huang, Nandialath, Alsayaghi, Emine, & Karadeniz, 2013). Therefore, there is a need for entrepreneurs to establish social networks. Furthermore, in a traditional and typical "relationship-oriented" society like China, social interaction has a more profound impact on entrepreneurial behavior. For household entrepreneurs, social interaction can provide technical expertise, material capital, valuable information, and financial and emotional support, which is particularly evident in rural China (Hu & Zhang, 2014; Wang & Zhao, 2012). According to the data from China's rural survey, Ma and Yang (2011) find that social networks can alleviate information asymmetry. The broader a rural household's social network is, the more private lending channels they have, and the higher possibility they have to establish a self-employed business in sectors such as the service industry and e-commerce. Guo, Zhang, and Y, Y. (2013) studies the role of the clan network in the process of farmers' entrepreneurship and finds that the strength of the clan network has a positive impact on rural household entrepreneurship. In addition, social interaction not only helps individuals obtain private financing, such as loans from friends and family, but also improves the possibility of obtaining loans through formal financial institutions, such as banks (He & Chen, 2019). Sedeh, Abootorabi, and Zhang (2020) find that social interactions assist individuals in establishing closer relationships with the government and encourage them to be entrepreneurs.

With the rise of the Internet, the extent of social networks has been expanded, bringing more convenience to entrepreneurs. Before making business decisions, information exchange via the Internet can help entrepreneurs better grasp business opportunities. In the process of entrepreneurship, enterprises must continuously procure resources and funds to ensure sustainable development. Venture investors or investment institutions to provide financial support can be found via the Internet, relieving financial pressure. In addition, as a social interaction channel, the Internet not only promotes the accumulation of social capital, but also further strengthens the demonstration effect formed by the success of entrepreneurship.

Some research also shows the limitations of offline social interaction. Davidsson and Honig (2003) believe that purely depending on offline friends for capital is not enough. With the fast-growing use of the Internet and social networking sites, it has become imperative

to maintain not only offline network relationships but also online ones. Online social networks provide individuals with a large network and reduce the cost of searching (Leyden, Link, & Siegel, 2014). Online social networks also increase the possibility of finding a better means to implement goals in the midst of several available options (Wang, Van Fleet, & Mishra, 2017).

Some scholars focus on the usage of the Internet and entrepreneurship in China. Gu and Li (2016) believe that the Internet has a trend of "decentralization" and "disintermediation", which brings good "Internet" entrepreneurial opportunities to small and medium-sized cities and towns. In recent years, some scholars conduct empirical studies with Chinese data. Zhou and Fan (2018) make an empirical analysis of CFPS microdata and show that using the Internet increases the probability of family entrepreneurship by 3%. Wu, Jiang, and Yuan (2020) conduct an empirical study to show that offline social networks can significantly and positively influence the entrepreneurial performance of farmers' e-commerce.

In sum, extant research has shown that both online and offline social interactions have an impact on a family's choice to start a business; however, most of these studies have focused on either online or offline social interactions, and their synergy has not been fully considered. Given the background of the increasingly close combination of online and offline social activities, it is meaningful to study the synergy effect of the two interactions on the choice of household entrepreneurship.

3. Theoretical analysis and research hypotheses

Offline social interactions are face-to-face social activities conducted through interpersonal communication, group meals, and so on. Online social interactions can be conducted through the Internet and other online intermediates, which are not in face-to-face form. By engaging in social activities, householders will benefit from their interactive behaviors. First, they can increase their access to relevant information through both traditional and modern methods. For households who intend to start their own business, valuable information will help to capture commercial opportunities during the initial stage and the ongoing operation stage after enterprise establishment. Second, social engagement can facilitate company fundraising. Lack of capital is a non-negligible constraint to the success of entrepreneurship (Hurst & Lusardi, 2004). Offline interactions aid potential entrepreneurs in receiving support from relatives or friends in the form of private loans. Third, social networks may change individuals' risk appetites and risk-taking willingness. Interactions can change people's value orientation and risk preference by promoting information dissemination, interpersonal communication, and so on, which will have a potential impact on entrepreneurial decision-making. All of the aforementioned benefits will lead to an increase in an individual's willingness to become an entrepreneur.

Based on the previous discussions and analyses, we propose the following hypothesis:

Hypothesis 1.   Both online and offline social interactions have positive impacts on households' willingness to become entrepreneurs.

For entrepreneurs, information acquisition is vital and directly affects their utilization of entrepreneurial opportunities (Shane & Venkataraman, 2000). Gaining access to useful information, such as opportunities to generate sufficient profits, is the first step to becoming an entrepreneur (Barnett, Hu, & Wang, 2019). Both offline and online social interactions broaden households' access to information resources. For offline social interactions, people can exchange information through dinners, sports, or other interactive activities. For online social interactions, platforms such as WeChat and LinkedIn break the bounds of time and space, making it more convenient for people to transfer information with each other. By obtaining more information related to entrepreneurship, the information asymmetry problem will mitigate, thus reducing the risk and cost to their business (Wang, Mou, & Sheng, 2019). Therefore, we propose the second hypothesis as follows:

Hypothesis 2.   Social interactions stimulate household entrepreneurship by promoting household information acquisition.

Financing constraints have been proven to be a critical factor influencing households' entrepreneurship (Kerr & Nanda, 2011; Tan & Li, 2022). Extant research suggests that households with low financing constraints are more likely to choose to become entrepreneurs (Zhang & Zhang, 2019). By engaging in social interactions, households are more likely to get formal or private financial support. On the one hand, as the frequency of social interaction increases, the degree of interpersonal trust deeps, so individuals can receive more private financial assistance when they are in need of financial support. On the other hand, by engaging in social interactions, households have more access to information about obtaining formal financial support. For example, households can get information about low-interest rate loans provided by banks. If households are not engaged in social interactions in normal times, when they face financing constraints, maybe the only choice is to turn to their parents or children, or even not to borrow money from others because they lack suitable channels for seeking help. Thus, we propose Hypothesis 3 as follows:

Hypothesis 3.   Social interactions promote household entrepreneurship by relaxing household financing constraints.

The relative wealth concern effect began with the discovery of the "income happiness paradox" (Easterlin, 1974). When people's income levels are relatively low, absolute income increases can lead to an increase in subjective well-being; however, when income reaches a certain level, the effect of absolute income on subjective well-being begins to weaken and the effect of relative wealth becomes more important (Ferrer-i-Carbonell, 2005). People can reach out to families with a higher standard of living than their own through offline social interactions. People can also learn about the lives of more affluent families through online social interaction. When people focus on a higher quality of life, they become motivated to increase their income and improve their living standards through entrepreneurship. Thus, Hypothesis 4 is proposed as follows:

Hypothesis 4.   Social interactions promote household entrepreneurship by the effect of relative wealth concern.

4. Empirical analysis design

4.1. Data sources and data processing

We use the data from CFPS for empirical analysis. CFPS is a nationally representative, biannual longitudinal survey of Chinese communities, families, and individuals launched in 2010 by Peking University. CFPS is designed to collect individual-, family-, and county-level data in contemporary China; it covers 31 provinces, 337 prefecture-level cities, and approximately 2800 counties.[2] In this study, we use panel data from 3 years from individual and family questionnaires to conduct empirical research on household entrepreneurship choices. Household-related information is obtained from the family questionnaire, and information about family members is collected from individual questionnaires. The data used for this study are selected from 2014, 2016, and 2018 issues. We control the county-level district fixed effect and year-level time fixed effect. The data are winsorized at 1% and we exclude samples with missing values.

Here, we would like to illustrate that, though there are data from individuals, this study focuses on household-level research; thus, individual-level data are processed to generate household-level variables according to individuals' family ID. Unlike the concept of "family" in western society, the Chinese family has a strong undertaking function. Fei, Fei, Hamilton, and Zheng (1992) stated that in the West, families are groups that have an organizational character. Western families have strict boundaries, couples are the main axis of them, and the birth and raising of children is the main content of family life. However, a Chinese family has long-term continuity and serves as an unit to organize other activities. In addition to childbirth, the family also bears political, economic, and religious functions. Mainstream Chinese society is greatly influenced by Confucianism, and the Chinese-style ethics determined by patriarchy consider the family to be the foundation of the country. In Chinese society, individual investment, education, and employment decisions not only concern individuals but also affect the development and career prospects of the entire family. The relationships that individuals establish in society also extend to other members of the family that the individuals belong to. Chinese people often engage in economic activities and social interactions on a household basis (Xie, Hu, & Zhang, 2014). Some important social phenomena in Chinese society, such as economic life, housing, child-rearing, and eldercare, all take place at the family level. Since entrepreneurship requires initial capital as well as significant resources such as labor (Ratinho, Harms, & Walsh, 2015; Ucbasaran, Westhead, & Wright, 2008), the entrepreneurial choices of individual family members essentially represent the entrepreneurial choices of and support from the entire family; thus, it is very difficult and impractical to separate individuals from the family. Thus, the core dependent variable, core independent variables, and control variables are all household-level data to ensure consistency.

4.2. Definition and measurement of variables and descriptive statistics

4.2.1. Core dependent variable

The core dependent variable of this paper is whether a family starts a business. As long as at least one member of a household chooses to start a business, we define the household as an entrepreneurial household (*Entre*). CFPS questionnaires use the question *"In the past 12 months, did any of the family members engage in self-employed business (individually operated business or private enterprises)?"* as a measure. Using the response to this question, we construct a dummy variable as the core dependent variable. If the response is *"Yes"*, the value of the dummy variable is 1. Otherwise, the value is 0.

4.2.2. Core independent variable

The core independent variable for this study is social interaction, which consists of online and offline interaction.

We choose household gift expenses (*Offline_social*) as the proxy for offline social interaction, and this variable has been shown to be a suitable proxy for offline social interaction in previous studies (Hu, Wang, & Zhang, 2018; Hu & Zhang, 2014; Ma & Yang, 2011). Chinese society is characterized by "human relations", and one of the common ways to maintain these relations is to take part in social activities, such as wedding ceremonies, graduation parties and birthday parties. When guests attend such events, it is an unspoken rule for them to give gifts or money. The value of the gift is closely related to the degree of relationship intimacy. During these events, close friends and relatives are commonly required to provide expensive gifts to demonstrate the closeness of the relationship. In addition, giving a reciprocal gift is necessary. Chinese people believe that courtesy demands reciprocity, and gifts play a crucial role in Chinese social interactions. Furthermore, if people need others' help, they tend to send signals and requests in the way of providing higher-value gifts. Thus, more money spent on gifts tends to indicate that the household has more offline social interactions, which also implies that the household may enjoy more social resources or more opportunities for assistance. This variable can be obtained from the question *"In the past 12 months, what was the total amount of money your family spent on gifts for social relations?"* Considering that some families spend 0 in this category, we use the value *ln*(household gift expenses + 1) to calculate the household average.

We use Internet social frequency (*Online_social*) as an index for online social interaction, and it has proved to be adequate in previous studies (Bhimani, Mention, & Barlatier, 2019; Hu, Liu, & Gu, 2018; Wang, Liang, Mahto, Deng, & Zhang, 2020). This

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indicator directly measures how many times a respondent participates in online social activities, which is obtained from the response to the question *"In general, how frequently do you use the Internet to socialize (e.g., chatting, posting)?"* Since this question is derived from the individual-level questionnaire, we use the average level of family members as a proxy.[3]

4.2.3. Control variables

Since the core dependent variable and core independent variables are both household-level, we select household-level control variables as well. The control variables influence whether a family starts a business or not. In extant studies (Ma & Yang, 2011; Hu & Zhang, 2014; Hu et al., 2018; Zhou & Fan, 2018; Bhimani et al., 2019; He & Chen, 2019; Zhang & Shi, 2019; Xu & Ma, 2022), the control variables selected mainly include financial status, demographic statistics, and backgrounds of the household. Thus, in this study, the control variables include household net assets (*Net_asset*), household net income(*Net_income*), the value of other real estates beside the present domicile (*Other_housing*), the value of financial products (*Finan_product*), the value of bank loans (*Bank_loan*), the value of loans to relatives and friends (*Private_loan*), household size (*Family_number*), the proportion of household members under the age of 16 (*Child_ratio*), the proportion of household members over the age of 60 (*Elder_ratio*), average years of schooling of adult household members[4] (*Education*[5]) and proportion of healthy adult household members (*Health*). The definitions and descriptive statistics of all variables are shown in Table 1:

The mean of the core dependent variable is 0.116, which indicates nearly 12% of the families in the survey have started their own businesses. The means of the two independent variables are 7.107 and 2.154 with standard deviations of 2.546 and 2.405, respectively.

4.3. Baseline model

This paper focuses on the impact of social interaction on family entrepreneurship. Considering the core dependent variable is a categorical variable, following prior studies, we choose the Probit model to estimate the impact. The equation for the Probit model is as follows:

$$Prob(Entre_{it} = 1) = \Phi(\alpha_1 \times Social_{it} + \alpha_2 \times Control_{it} + \gamma_t + \theta_t + \varepsilon_t) \tag{1}$$

In Eq. (1), *Entre*$_{it}$ indicates whether the household i in year t is starting a business; *Social*$_{it}$ indicates the social interaction variable, which includes two core explanatory variables, online and offline social interaction. *Control*$_{it}$ indicates the control variables (*Control*). γ_t represents the district dummy variable, which is used to control the county-level district fixed effect (*District*); θ_t refers to the time fixed effect (*Year*); ε_t represents the random disturbance term.

5. Empirical results

In this part, we report the empirical results of the baseline regression in Section 5.1. Section 5.2 is a further discussion about household entrepreneurial intensity and performance. In Section 5.3, we turn our focus to the endogeneity problem. Section 5.4 covers mechanism analysis. Finally, we report the results of the heterogeneity analysis in Section 5.5.

5.1. Baseline regression

Table 2 shows the Probit regression result of the baseline model, including the average marginal effect and robust standard error. Columns (1) and (2) report the results when only offline or online social interaction is considered. Column (3) shows the regression result when the two types of interaction are considered simultaneously.

The regression results show that the two core explanatory variables, the household gift expenses and the frequency of Internet social interaction, both have significant positive effects on a household's entrepreneurial choice, which is consistent with Hypothesis 1. When considering only online social interaction, as the frequency of social interaction increases, so does the willingness to start a business, with an average marginal effect of approximately 0.54%. When a potential entrepreneur's online and offline interactions are taken into consideration simultaneously, the promotion effect is also significant. This comparison shows that in the baseline model, both online and offline social interactions have a significant impact on starting a self-owned business.

In terms of control variables, we discover some control variables that have significant impacts on household entrepreneurial choice. We find that household net asset (*Net_asset*) and net income (*Net_income*) are positively correlated with entrepreneurship. In addition, both household debt-related variables (*Bank_loan* and *Private_loan*) have significant positive impacts on entrepreneurial willingness. This may be because entrepreneurial enthusiasm is stimulated by the family burden and personal drive. There is also a positive

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[3] The responses to this question include seven options: "almost every day", "3–4 times a week", "1–2 times a week", "2–3 times a month", "once a month", "once a few months", and "never". We convert the aforementioned options to the number of times people socialized on the internet each week: 7, 3.5, 1.5, 0.375, 0.03, 0.01 and 0, respectively. For people who do not use the Internet, the value is 0. Furthermore, we take the mean of the responses of the members of the household aged between 18 and 60 years as the value of this variable.

[4] "Adult household members" are those aged 18 to 64 years at the time of the surveys.

[5] The variable is constructed based on the respondent's highest level of education, with 0 years for non-education, 6 years for primary school, 9 years for junior high school, 12 years for senior high school, 13 years for technical secondary school or technical school, and 15 years for vocational school, 16 for undergraduate, and 19 years for graduate or above.

Table 1
Definitions and descriptive statistics of all variables.

Type	Variable	Definition	N	Mean	Std	Max	Min
Core Dependent Variable	*Entre*	Whether a household starts a business: yes = 1, no = 0	24,444	0.116	0.320	1	0
Core Independent Variable	*Offline_social*	Ln (household gift expenses+1)	24,444	7.107	2.546	12.206	0
	Online_social	Internet social frequency	24,444	2.154	2.405	7	0
	Net_asset	Ln (Household net assets+1)	24,444	12.400	1.443	17.748	0
	Net_income	Ln (Household net income+1)	24,444	10.732	1.069	16.248	1.609
	Other_housing	Ln (the value of other real estate owned+1)	24,444	2.261	4.842	17.728	0
	Finan_product	Ln (the value of financial products+1)	24,444	0.561	2.431	16.118	0
	Bank_loan	Ln (the value of bank loans+1)	24,444	0.846	2.881	15.202	0
	Private_loan	Ln (the value of loans owes to relatives and friends +1)	24,444	1.504	3.638	15.425	0
Control Variables	*Family_number*	Household size	24,444	4.073	1.838	21	1
	Child_ratio	Ratio of the number of those aged 0–15 years old to the total household size	24,444	0.160	0.173	0.800	0
	Elder_ratio	Ratio of the number of those aged over 60 years old to the total household size	24,444	0.128	0.212	1	0
	Education	Average years of schooling for adult household members	24,444	6.882	4.367	19	0
	Health	Proportion of healthy adult household members	24,444	0.717	0.335	1	0
	Performance	Profit generated by enterprises/ Assets invested to enterprises	2531	2.263	26.049	1000	0
	Intensity	Ln (Assets invested to enterprises)	2527	7.041	5.409	22.333	0
	IV1	County-level average of household Internet social frequency	24,444	1.989	1.328	7	0
	IV2	County-level average of household gift expenses	24,444	8.022	0.891	11.513	0
Other Variables	*Information*	How important hearing from others is as a communication path for the household	21,042	2.672	1.326	5	1
	Financing	If your family need to borrow a large amount of money, the first choices of borrowing money is from?	20,367	0.599	0.490	1	0
	Wealth	Household's relative income level in the local area	20,556	2.597	1.029	5	1

Table 2
Baseline regression results.

Variables	(1)	(2)	(3)
Online_social	0.0054***		0.0053***
	(0.001)		(0.001)
Offline_social		0.0036***	0.0035***
		(0.001)	(0.001)
Net_asset	0.0528***	0.0526***	0.0521***
	(0.004)	(0.004)	(0.004)
Net_income	0.0334***	0.0337***	0.0324***
	(0.003)	(0.003)	(0.003)
Other_housing	0.0003	0.0002	0.0002
	(0.000)	(0.000)	(0.000)
Finan_product	−0.0029***	−0.0028***	−0.0030***
	(0.001)	(0.001)	(0.001)
Bank_loan	0.0057***	0.0058***	0.0057***
	(0.001)	(0.001)	(0.001)
Private_loan	0.0048***	0.0048***	0.0047***
	(0.001)	(0.001)	(0.001)
Family_member	−0.0004	−0.0004	−0.0005
	(0.001)	(0.001)	(0.001)
Child_ratio	0.0563***	0.0584***	0.0577***
	(0.014)	(0.014)	(0.014)
Elder_ratio	−0.0483***	−0.0525***	−0.0474***
	(0.012)	(0.012)	(0.012)
Education	−0.0011	−0.0002	−0.0011*
	(0.001)	(0.001)	(0.001)
Health	0.0126*	0.0154**	0.0125*
	(0.007)	(0.007)	(0.007)
District	Yes	Yes	Yes
Year	Yes	Yes	Yes
Observations	24,444	24,444	24,444
Pseudo R^2	0.1618	0.1609	0.1626

This table reports baseline regression results using Probit regression. The core dependent variable is household entrepreneurship (*Entre*), core independent variables are online social interaction (*Online_social*) and offline social interaction (*Offline_social*), respectively. Online social interaction is measured by household gift expenses and offline social interaction is measured by household Internet social frequency. The coefficient in parentheses is the robust standard error. *, **, and *** are significant at the levels of 10%, 5%, and 1%, respectively.

correlation between the proportion of children (*Child_ratio*) in a family and the willingness to start a business. This may stem from bequest motivation and corresponding costs of childrearing. However, the proportion of elders (*Elder_ratio*) in the family is negatively correlated with the willingness to start a business. This reveals the possible conservative tendency due to more elderly people in the family.

5.2. Further discussion

In Section 5.1, we demonstrated that online and offline social interactions have significant positive effects on household entrepreneurial willingness. Based on this finding, we further investigate whether social interactions impact household entrepreneurial intensity (*Intensity*) and performance (*Performance*). The entrepreneurial intensity and performance here refer to the amount of assets invested in and the profit ratio (return on assets) of the founded enterprises, respectively. We only retain households that started their businesses in this section. The variable *Intensity* can be obtained from the responses to the question *"How much are the total assets of the operated business/private enterprise run by your family?"* and its logarithm is used in Probit regression. We use the responses to the question *"After deducting the costs, the net profit of the operated business/private enterprise in the past 12 months"* as the proxy for an enterprise's net profit. We then divide net profit by *Intensity* and employ it as the proxy for *Performance*. The results are shown in Table 3.

Columns (1) to (3) show that participation in social interactions can increase the entrepreneurial intensity of a family at the significance level of 1%. Specifically, when only online social interaction is considered, the estimated coefficient is 0.2542 as shown in Column (1); when only offline social interaction is considered, the estimated coefficient is 0.1369; and when both online and offline social interactions are considered simultaneously, the estimated coefficients are 0.2507 and 0.1259, respectively. These results suggest that participation in both online and offline social networks contribute to the intensity of household entrepreneurship. Columns (4) to (6) report similar findings regarding the performance of the founded enterprises. Thus, we conclude that, by engaging in social interactions, the investment intensity and performance of the enterprises of households are significantly improved.

These results can be explained by the benefits brought by social interactions. On the one hand, by participating in social interactions, families have access to more valuable and effective information, which means that they have a more comprehensive estimate and prediction of the possible future risks and benefits when making entrepreneurial choices. As a result, households will make better entrepreneurial choices and are more likely to make high profits. Similarly, better information makes households more confident of being successful, which will make them willing to invest more initial capital. On the other hand, participation in social interactions relaxes the financing constraints faced by households, and they are able to invest more capital in entrepreneurship. Due to economies of scale, larger-scale entrepreneurial investments allow entrepreneurial households to capture more profit from increased scale, improving their entrepreneurial performance.

5.3. Discussion of endogeneity

Possible endogeneity may arise from reverse causality or missing variables. Household choices of starting businesses may also stimulate online and offline social needs, which will lead to reverse causality. At the same time, some variables may be omitted, or some aspects of the problem are not reflected in the questionnaires. An instrumental variable (IV) for regression is needed. County-level averages of core variables are usually used as IVs (Ellis, Martins, & Zhu, 2017; Fu, Liao, & Zhang, 2016; Yin & Zhang, 2020; Zhang & Wan, 2016). On the one hand, there is little difference in social interactions between households within the same county, while obvious differences may exist between households in different counties. Specifically, households living within the same county face the same conditions in terms of transportation, Internet infrastructures, and social customs, which will lead to similar social interaction behaviors; while households in different counties may have different social interaction behaviors due to differences in customs and transportation. On the other hand, a household's social behavior is more likely to be influenced by other households in the same county, but this household's entrepreneurial choices are not directly influenced by the social interaction behaviors of other households. Thus, we use the county-level average Internet social frequency (*IV1*) as the instrumental variable of online social interaction and county-level average household gift expenses (*IV2*) as the instrumental variable of offline social interaction.

We use the two-stage IV Probit regression to resolve the endogeneity problem. Table 4 reports the estimation results. We conduct weak-instrument robust tests to determine whether the IVs are weak, and we reject the hypothesis of the instruments are weak. Columns (1) and (3) report the results of the first stage, while Columns (2) and (4) are the results of the second stage. We find that the significance of the core dependent variables of social interaction is consistent with the results in Table 2. All of the core dependent variables are significant and positive. This also proves the robustness of the regression.

5.4. Mechanism analysis

5.4.1. Information acquisition

We choose the appropriate channel variables to verify the mechanism of information acquisition. Specifically, we use households' responses to the question *"How important is hearing from others as a communication path for you?"* as the channel variable *Information* (Barnett et al., 2019). According to the questionnaire, there are 5 options to this question: 1 means very unimportant, 5 means very important. The regression results are shown in Table 5.

Column (1) of Table 5 shows that the coefficients of the interaction term *Online_social × Information* are positive and significant at the 1% level. The result in Column (2) shows that the information channel mechanism is equally effective for offline social interactions.

Table 3

Regression results on entrepreneurial investment intensity and performance.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Intensity	Intensity	Intensity	Performance	Performance	Performance
Online_social	0.2542***		0.2507***	0.0658**		0.0623**
	(0.063)		(0.062)	(0.030)		(0.030)
Offline_social		0.1369***	0.1259***		0.0477***	0.0406***
		(0.076)	(0.079)		(0.019)	(0.019)
Control	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.4627	0.4341	0.4838	0.5242	0.5904	0.5849
Observations	2527	2527	2527	2531	2531	2531

This table reports baseline regression results using Probit regression. Core dependent variables are household entrepreneurial intensity (*Intensity*= Profit generated by enterprises/ Assets invested to enterprises) and household entrepreneurial performance (*Performance*, measured by assets invested to enterprises), respectively. Core independent variables are online social interaction (*Online_social*) and offline social interaction (*Offline_social*), respectively. Online social interaction is measured by household gift expenses and offline social interaction is measured by household Internet social frequency. The coefficient in parentheses is the robust standard error. *, **, and *** are significant at the levels of 10%, 5%, and 1%, respectively.

Table 4

Regression results using instrument variables.

Variables	Online_social (First stage)	Entre (Second stage)	Offline_social (First stage)	Entre (Second stage)
	(1)	(2)	(3)	(4)
*IV*1	0.173***		0.193**	
	(0.018)		(0.101)	
*IV*2	0.102**		0.0182***	
	(0.053)		(0.007)	
Online_social		0.189***		
		(0.091)		
Offline_social				0.116**
				(0.059)
Control	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Pseudo R^2	0.3579	–	0.2780	–
Observations	24,444	24,444	24,444	24,444
Kleibergen-Paap Wald F Statistic	59.731	–	43.595	–
Stock-Wright P- value	0.000	–	0.000	–

This table shows the results of 2SLS probit regression. *Entre* is household entrepreneurship, *Online_social* is household online social interaction (measured by household gift expenses) and *Offline_social* is household offline social interaction (household Internet social frequency), respectively. IV1 is county-level averages of *Online_social*, IV2 is county-level averages of *Offline_social*. The Kleibergen-Paap Wald F statistic is the test statistic for weak identification, and the Stock-Wright LM *p*-value is the test statistic for weak-instrument robust inference. The coefficient in parentheses is the robust standard error. *, **, and *** are significant at the levels of 10%, 5%, and 1%, respectively.

When both online and offline social interactions are considered, the coefficients of the interaction term are also significantly positive, as shown in Column (3). Thus, we conclude that the mechanism of information acquisition is effective. Thus, Hypothesis 2 is verified.

5.4.2. Financing constraints relaxing

We use the responses to the question *"If your family need to borrow a large amount of money, the first choice of borrowing money is from?"* as the proxy of the channel variable (*Financing*). According to the questionnaire, households could choose their answers from following choices: parents or children, relatives, friends, banks, formal financial institutions other than banks, individual or private loan institutions, and will not borrow money under any condition. We exclude samples whose responses are parents or children or will not borrow money under any condition. For the remaining samples, if households choose relatives, friends, or individual or private loan institution, *Financing* = 1; else, *Financing* = 0. The regression results are shown in Table 6.

Regression results in Table 6 show that the mechanism of financing constraints relaxing is effective. The coefficients of interaction terms are significantly positive at the 1% level when online social interactions or offline social interactions are considered separately. The results in Column (3) illustrate that this mechanism remains valid since the coefficients are still significantly positive when both online and offline social interactions are considered simultaneously. Thus, Hypothesis 3 is verified.

Table 5
Mechanism of information acquisition.

Variables	(1)	(2)	(3)
Online_social	0.0075***		0.0086***
	(0.002)		(0.002)
Offline_social		0.0057***	0.0050***
		(0.002)	(0.002)
Online_social × Information	0.0028***		0.0017***
	(0.001)		(0.001)
Offline_social × Information		0.0016***	0.0024***
		(0.001)	(0.001)
Information	0.0064***	0.0120**	0.0137***
	(0.002)	(0.006)	(0.006)
Control	Yes	Yes	Yes
District	Yes	Yes	Yes
Year	Yes	Yes	Yes
Pseudo R^2	0.2379	0.2681	0.2852
Observations	21,042	21,042	21,042

This table reports the results of the mechanism of information acquisition using channel variable. *Information*, measured by the responses to the question *"How important is hearing from others as a communication path for you?"*, is selected as the channel variable. The coefficient in parentheses is the robust standard error. *, **, and *** are significant at the levels of 10%, 5%, and 1%, respectively.

Table 6
Mechanism of financing constraint relaxing.

Variables	(1)	(2)	(3)
Online_social	0.0047***		0.0052***
	(0.0018)		(0.0019)
Offline_social		0.0051***	0.0049***
		(0.0024)	(0.0023)
Online_social × Financing	0.0037***		0.0032***
	(0.0016)		(0.0015)
Offline_social × Financing		0.0030***	0.0033***
		(0.0014)	(0.0014)
Financing	0.0061***	0.0064**	0.0077**
	(0.0028)	(0.0033)	(0.0039)
Control	Yes	Yes	Yes
District	Yes	Yes	Yes
Year	Yes	Yes	Yes
Pseudo R^2	0.3179	0.3470	0.3901
Observations	20,367	20,367	20,367

This table reports the results of the mechanism of financing constraint relaxing using channel variable. *Financing*, measured by the responses to the question *"If your family need to borrow a large amount of money, the first choice of borrowing money is from?"* is selected as the channel variable. The coefficient in parentheses is the robust standard error. *, **, and *** are significant at the levels of 10%, 5%, and 1%, respectively.

5.4.3. Relative wealth concern

The response to the question *"What is your relative income level in your local area?"* is selected as the channel variable (*Wealth*). According to the questionnaire, 5 choices are available for respondents: 1 for low and 5 for very high. The empirical results are shown in Table 7.

Table 7 shows that the interaction terms, *Online_social × Wealth* and *Offline_social × Wealth*, are significantly positive. Thus, the mechanism of relative wealth concern is valid. These results verify Hypothesis 4.

5.5. Heterogeneity analysis

Although our previous regressions and analyses have proven that social interactions can foster households' entrepreneurship, this only reflects the overall impact of the full sample. To show the impact of online and offline social interactions on household entrepreneurship more accurately, we conduct heterogeneity analyses from the aspects of hukou, regional differences, and household debt level.

5.5.1. Impact of social interaction on entrepreneurship for households with different hukou

In recent years, China's urbanization rate has shown steady growth, going from 54.77% in 2014 to 64.72% in 2021, as shown in Fig. 2. The Chinese "mass entrepreneurship and innovation" policy aims to tap into innovative potential and promote entrepreneurial development among the public, and migrant residents with agricultural hukou who already live in urban areas are the targeted groups

Table 7
Mechanism of relative wealth concern.

Variables	(1)	(2)	(3)
Online_social	0.0075***		0.0071***
	(0.003)		(0.003)
Offline_social		0.0080***	0.0087***
		(0.003)	(0.003)
Online_social × Wealth	0.0029***		0.0025***
	(0.001)		(0.001)
Offline_social × Wealth		0.0027***	0.0019***
		(0.001)	(0.001)
Wealth	0.0059**	0.0049**	0.0045***
	(0.003)	(0.003)	(0.002)
Control	Yes	Yes	Yes
District	Yes	Yes	Yes
Year	Yes	Yes	Yes
Pseudo R^2	0.2901	0.2674	0.2865
Observations	20,556	20,556	20,556

This table reports the results of the mechanism of relative wealth concern using channel variable. *Wealth*, measured by the responses to the question *"What is your relative income level in your local area?"* is selected as the channel variable. The coefficient in parentheses is the robust standard error. *, **, and *** are significant at the levels of 10%, 5%, and 1%, respectively.
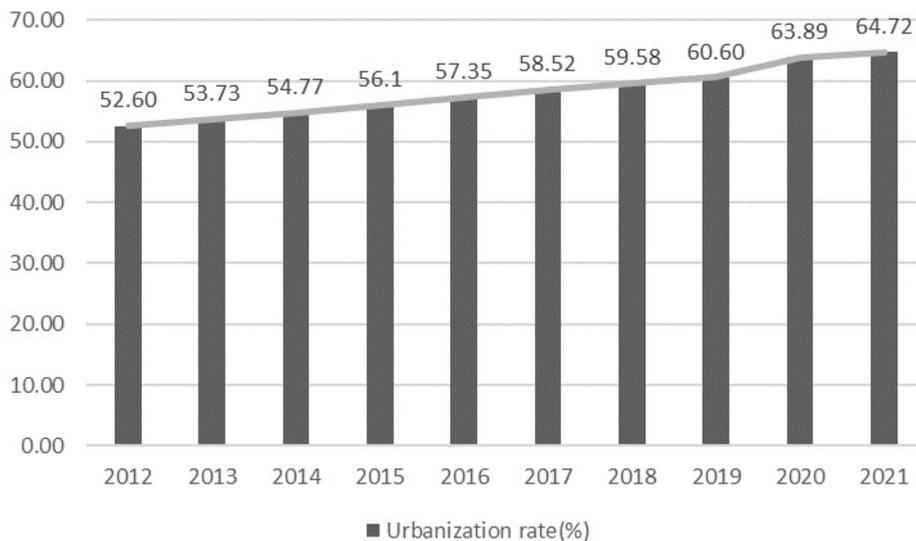
Fig. 2. Urbanization rate in China (2012–2021).

of this policy. The migrant residents have made the transition from the countryside to the city, made great contributions to China's economic development (Cheng, Wang, & Smyth, 2014), and became a bridge between the rural and urban regions. In general, there is a gap between urban and rural areas in China. Per capita income in urban areas is higher than that in rural areas, and people who originally lived in rural areas and then migrated to urban areas are more likely to perceive the differences between rural and urban areas through various social activities. On the one hand, offline social networks can make them feel the income and wealth gap between cities and the countryside directly; on the other hand, through online social networks, they can observe the bigger gap in other aspects such as luxury trips. This in turn motivates them to narrow these gaps for a better life, with starting a business being one of the most effective ways to increase their income. Thus, for these potential entrepreneurs, social interactions may enhance their entrepreneurial willingness.

We classify the samples into three categories based on their hukou: those with agricultural hukou who live in rural areas as the first group, those with nonagricultural hukou who live in urban areas as the second group, and those with agricultural hukou who live in urban areas (migrant residents) as the third group. Table 8 shows the regression results for the three groups.

Columns (1) to (3) in Table 8 show that for rural households, the effect of offline social interactions is positively significant, and the average marginal effect is 0.25%. For urban households, shown in Columns (4) to (6), online social interaction has a significant and positive impact on entrepreneurial choices, and the coefficient is 0.87%. For migrant resident households, shown in Columns (7) to (9), both online and offline social interactions have positively significant effects on entrepreneurial willingness. In terms of the marginal effects, online social interaction is even higher than offline; in other words, the migrant resident population's entrepreneurial choices

Table 8

Regression results for households with different hukou.

Variables	First group: rural households			Second group: urban households			Third group: migrant resident households		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Online_social	0.0023		0.0020	0.0087***		0.0087***	0.0081***		0.0078***
	(0.001)		(0.001)	(0.002)		(0.002)	(0.003)		(0.003)
Offline_social		0.0025*	0.0025*		−0.0001	−0.0006		0.0096***	0.0094***
		(0.001)	(0.001)		(0.002)	(0.002)		(0.003)	(0.003)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.1809	0.1942	0.1909	0.1803	0.1905	0.1916	0.1809	0.1942	0.1935
Observations	10,222	10,222	10,222	4256	4256	4256	4702	4702	4702

This table reports the regression results for households with different hukou. Samples are classified into three categories based on their hukou: those with agricultural hukou who live in rural areas as the first group, those with nonagricultural hukou who live in urban areas as the second group, and those with agricultural hukou who live in urban areas (migrant residents) as the third group. The coefficient in parentheses is the robust standard error. *, **, and *** are significant at the levels of 10%, 5%, and 1%, respectively.

are heavily influenced by online social networks.

Comparing Columns (1) to (3) with Columns (7) to (9), it is clear that the effects of online social interactions differ between household types. The reason may be that there is still a gap between rural and urban areas in terms of Internet infrastructure construction, overall literacy level, and so on. Rural social activities are usually limited to villages or small towns households live in. Thus, they communicate in an acquaintance community, which inhibits the demand for online social interaction. In addition, rural residents' potential entrepreneurial choices mainly rely on rural neighborhoods; thus, offline face-to-face interaction is essential when they come to fruition.

Another aspect worthy of mention is the migrant residents. Rural migrants in Chinese cities who have relatively low human and financial capital might also turn to community connections as an important source of information, advice, and even capital and resources while they are initially establishing their businesses. This is particularly true in an institutional environment where they cannot access formal capital, insurance, business contracts, and legal protection (Yueh & Reenen, 2012). One interesting case study documented the vibrant and flexible garment manufacturing cluster formed in a neighborhood in Guangzhou, where community ties enable migrants to adapt to the local economy through self-employment and small business establishments (Wang et al., 2015). During the initial stage of business establishment, offline interaction plays an important role. Later, both online and offline interactions prove advantageous, with online interaction being especially useful for boosting cost savings and efficiency.

5.5.2. Impact of social interaction on entrepreneurship for households in different regions

In addition to unbalanced urban-rural development, unbalanced regional development is another distinctive feature of Chinese society. First, for a long time, Chinese economic development has been characterized by an imbalance in regional development. According to the National Bureau of Statistics of China, per capita consumption expenditure is much higher in the eastern region than in the central and western regions. Second, there are distinct differences in geographical features between different regions. For example, the eastern region of China is flat and densely populated, while the western region is characterized by large area with sparse population. Third, due to the differences in natural conditions, transportation, and infrastructure in the eastern, central, and western regions, the imbalance between regions may lead to differences in how households interact with each other, which in turn has a different impact on their entrepreneurial choices. The level of offline social interaction is low for households in regions with poor transportation, and it is difficult for households with potential entrepreneurial intentions to obtain the information and experience support they need through inefficient offline social interactions. In this section, we divide the sample into three subsamples based on the provinces where the households are located: the eastern, central, and western regions.[6] The regression results are shown in Table 9.

In Table 9, Columns (1) to (3) report the regression results for households in the eastern region and show that both online and offline social interactions have significant and positive impacts on households' entrepreneurship choices. For households in the central and western regions, as shown in Columns (4) to (6) and Columns (7) to (9), respectively, only online social interactions promote households' choice to become entrepreneurs. This may be because online social interaction mainly takes place on the Internet and various social networking sites, and is virtually independent of transportation and physical geography. In contrast, offline social interactions are more restrictive. In the eastern region, people can easily socialize offline due to the good transportation facilities in the region, while households in the central and western regions do not have such conveniences. The relatively lower economic development level in the central and western regions makes it more difficult for potential entrepreneurs to procure information and

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[6] The three regions are divided using the geographic method rather than the conventional method based on economic development. The CFPS data contain the data of 25 provinces (or province-level municipalities). The eastern region includes 10 provinces: Beijing, Shanghai, Guangdong, Tianjin, Liaoning, Hebei, Jiangsu, Zhejiang, Fujian, and Shandong. The central region includes 8 provinces: Hubei, Hunan, Shanxi, Jilin, Heilongjiang, Anhui, Henan, and Jiangxi. The western region includes 7 provinces: Shaanxi, Guangxi, Sichuan, Chongqing, Yunnan, Gansu, and Guizhou.

Table 9
Regression results for households in different regions.

Variables	First group: eastern district			Second group: central district			Third group: western district		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Online_social	0.0059***		0.0058***	0.0051***		0.0050***	0.0046**		0.0045**
	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)
Offline_social		0.0038**	0.0038**		0.0038	0.0036		0.0039	0.0038
		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.1957	0.2370	0.2289	0.2642	0.2903	0.3026	0.2803	0.2745	0.2604
Observations	8529	8529	8529	6304	6304	6304	6192	6192	6192

This table shows the regression results for households in different regions. Samples are classified into three groups based on the provinces where the households are located. The coefficient in parentheses is the robust standard error. *, **, and *** are significant at the levels of 10%, 5%, and 1%, respectively.

exchange relevant information with peers directly, which leaves space for online interactions.

5.5.3. Impact of social interaction on entrepreneurship for households with different debt levels

This section will present the heterogeneity analysis based on household debt level. For households with different debt levels, their risk appetites may vary. The more actively an entrepreneur socializes, the more likely they are to obtain social capital from an incubator manager (Studdard & Munchus, 2009). In theory, a high debt level means families may lack seed capital and instead startup through funding from external groups. Social engagement is helpful in addressing financing difficulties for families that attempt to do business with insufficient capital. A larger social circle often means more social resources; thus, entrepreneurs are more likely to obtain financial support and take full advantage of the high efficiency of online social platforms. Online social interaction is complementary to traditional face-to-face offline social circles in solving the problem of startup; hence, entrepreneurial willingness will be enhanced. We use the median of all households' debt levels as a distinguishing criterion. Households below or equal to the median debt level are classified into the lower debt group, and households above the median debt level are categorized into the higher debt group. The result of the Probit regression on different levels of household debt is shown in Table 10.

Table 10 shows that the regression results of the two groups are significantly positive, which is consistent with our findings in the baseline regression. However, the marginal effects of the core independent variables for the higher debt level group are higher than those for the lower debt level group, implying that the promotion effect is more pronounced in the first group. A higher household debt level implies higher risk-taking, and the household members are usually inclined to be bolder. This means that the entrepreneurial incentive will be stimulated by the household burden.

6. Conclusion

In this paper, we focus on whether social interactions foster household entrepreneurship. We propose four hypotheses based on theoretical analysis. Using 2014, 2016 and 2018 CFPS panel data, we empirically examine the relationship between social interactions and household entrepreneurship. The regression results show that participation in social interactions has positive effects on household entrepreneurial choice, i.e., being engaged in online and offline social interactions can significantly increase households' entrepreneurial intention. This conclusion remains robust after considering the endogenous concern. The influence of social interactions on household entrepreneurial investment intensity and performance are also examined, and we conclude that they are also positively influenced by households' social interaction behaviors. We further discuss three potential influencing mechanisms, i.e., the mechanism of information acquisition, financing constraints relaxing and relative wealth concern, and the empirical results show that they are effective. For the heterogeneity analysis, we examine the influence of social interactions on household entrepreneurship from the aspects of hukou, region, and household debt level. The migrant resident population's entrepreneurial choices are heavily influenced by online social networks. In addition, the promotion effect of social interactions is more significant for households in the eastern regions. For households with a higher debt level, the promotion effect of online social engagement is more pronounced than for those with a lower debt level. Compared with extant research, the main contribution of our study is that we focus more on the synergy of online and offline interaction on household entrepreneurial intentions. Through theoretical analysis and empirical tests, we further expand the research on entrepreneurship from traditional social interaction to the contemporary Online-Merge Offline (OMO) style. Our research provides the following implications:

First, we find that both online and offline social interactions have significant positive effects on households' entrepreneurial choices. This indicates that entrepreneurs should take advantage of the resources and information supplied by social activities to promote their entrepreneurial activities. By interacting with relatives, colleagues, and other people through online and offline channels, households with the potential to become entrepreneurs are more likely to identify opportunities and then build their own businesses. Governments, both national and local, should pay attention to the impact of the synergy of online and offline social interactions on households' willingness to start businesses. By facilitating social interactions between individuals and the flow of information and capital, governments can utilize social interactions to promote the goal of "mass entrepreneurship and mass

Table 10

Regression results for households with different debt levels.

Variables	First group: higher debt group			Second group: lower debt group		
	(1)	(2)	(3)	(4)	(5)	(6)
Online_social	0.0126***		0.0121***	0.0068***		0.0080***
	(0.004)		(0.004)	(0.003)		(0.003)
Offline_social		0.0086***	0.0080**		0.0057**	0.0075***
		(0.004)	(0.004)		(0.003)	(0.003)
Control	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.1920	0.1854	0.1931	0.2167	0.2138	0.2167
Observations	3134	3134	3134	3845	3845	3845

This table shows the regression results for households with different debt levels. Samples are classified into two groups based on the median of all households' debt levels. The coefficient in parentheses is the robust standard error. *, **, and *** are significant at the levels of 10%, 5%, and 1%, respectively.

innovation."

Second, being engaged in social interactions also has a positive effect on household entrepreneurial intensity and profit. Our finding provides guidance for entrepreneurs who intend to invest more capital into their businesses. So building social interaction platform is part of the good business environment of local government. For example, through the websites, individuals can search for and obtain information on government incentive policies related to entrepreneurship to increase their confidence. With external help such as financing support, shared sales channels, and so on, entrepreneurs will become more capable of investing more in start-ups.

Third, for policymakers, our findings have strong practical implications. Governments should build mechanisms and platforms of interaction between them and entrepreneurs to further understand the difficulties and needs that entrepreneurs encounter. They should also provide funding, information matching, and tax incentives to help entrepreneurs achieve their goals. Governments should take effective measures to develop the digital economy. During the procedure, the governments also need to pay attention to the gap in social interaction between different households, and make the inclusive benefits of social interaction available to all households with entrepreneurial aspirations. Besides, policymakers should also focus on policies which impact specific groups. For example, for migrant resident households, since social interactions have a more significant impact on promoting their entrepreneurial choices, policymakers should consider how to stimulate their willingness to start their own businesses, which in turn will lead to equality between urban and rural areas. For households in different regions, policies should also be adjusted according to the actual situation. At the same time, the positive interactive role between households also needs the attention of policymakers and should be guided by them to form effective communication and positive interactions.

Limited by the availability of the latest data, one main shortcoming of this study is that we could not reveal the potential changes between social interaction and entrepreneurship after the Covid-19 epidemic. The epidemic alters the way people interact with each other, and online social interactions become more popular and important. In the future, we will continue to update our research and focus on this topic as relevant data becomes available.

Data availability

Data will be made available on request.

Acknowledgements

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