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Family-Oriented Migration and Entrepreneurship in Urban China: Evidence from the China Migrants Dynamic Survey

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Abstract

Urban entrepreneurship among China's rural migrant workers offers a crucial pathway toward increased household income and balanced urban-rural development. Using data from the 2017 wave of China Migrants Dynamic Survey, this paper introduces an index quantifying family-oriented migration and investigates its relationship with entrepreneurship. The results show that family-oriented migration significantly increases the likelihood of entrepreneurship among migrant workers. This result remains robust across a series of robustness checks, including propensity score matching, placebo tests, and models with stringent fixed effects. Mechanism analyses suggest that family-oriented migration fosters entrepreneurship primarily by enhancing income motivation and social integration. However, peer effects negatively moderate the positive impact of family migration on entrepreneurship, while also weakening the positive influence of social integration and income motivation on entrepreneurial outcomes. Heterogeneity analysis indicates that this promotive effect is more pronounced among women, low-skilled migrants, and those engaged in low-tech industries, necessity-driven entrepreneurship. Regionally, the effect is strongest in central China relative to eastern and western counterparts. In terms of household structure, the effect is most pronounced in "Couple Only" households, followed by "Nuclear Family" households, and weakest in "Joint Family" households. These findings underscore the multifaceted role of families in promoting entrepreneurial decisions via risk control, resource pooling, and identity reconstruction, highlighting the need for supportive urban policies toward family migration and migrant entrepreneurship.

Keywords Migrant entrepreneurship · Family-oriented migration · Social integration · Income growth motivation · Peer effects

JEL Classification J61 · L26 · O15 · J24 · D13

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1 Introduction

Since the reform and opening-up and the gradual relaxation of restrictions on rural labor mobility (Zhang & Song, 2003; Gong et al., 2012), China has experienced the world's largest internal rural-to-urban migration, closely linked to rapid urbanization (Yan et al., 2024). Unlike international migration, China's internal migration is profoundly shaped by the hukou system, which institutionalizes structural constraints by restricting rural migrants' access to urban welfare, employment, and social rights (Wang, 2005; Tyner & Ren, 2016; Hung, 2022), thereby generating challenges for migrants that are analogous in nature yet fundamentally distinct in mechanism from those encountered by international migrants. Although the massive influx of migrant workers into cities has led to increasingly challenging employment conditions (Chan, 2010; Yang & Qu, 2020), particularly for low-skilled labor, the diversified consumer demand and relatively favorable business environment in urban areas have created new opportunities for migrant entrepreneurship. Data from the China Migrants Dynamic Survey (2009–2017) indicate that the proportion of self-employed migrant workers in urban employment remained stable at 40–45%, making entrepreneurship a crucial pathway for urban employment and social integration (Liu et al., 2019).

Meanwhile, the migration pattern of migrant workers has gradually shifted from individual-oriented to family-oriented, with an increasing trend toward nuclear families migrating together in recent years (Xu & Xia, 2014). Family-oriented migration not only optimizes resource allocation and strengthens intra-family cooperation, but may also profoundly influence migrants' entrepreneurial and broader economic strategies (Kok, 2010; Bird & Wennberg, 2016; Li & Johansen, 2023). Within China's distinctive family culture characterized by Confucian filial piety and family responsibility, migrant workers' entrepreneurial decisions are often driven by dual aspirations: achieving economic advancement and social status enhancement for the entire family unit. Moreover, this family-oriented migration transcends mere economic optimization and reflects deeper cultural imperatives that prioritize family unity and intergenerational responsibility. Traditional filial piety culture and family responsibility create strong expectations for caring for aging parents and parental care for minor children, leading many rural families to choose joint migration and view separation as a violation of fundamental family values. Against this backdrop, this study introduces the degree of family-based migration as the core explanatory variable and addresses two key questions: Does family-oriented migration facilitate entrepreneurial activity among migrant workers? If so, through what mechanisms does this effect manifest?

This study uses the 2017 wave of the China Migrants Dynamic Survey (CMDS), a large-scale cross-sectional survey that provides detailed county-level data for both migrants' origins and destinations, allowing us to analyze the effects of family migration with a rigorous identification strategy that includes dual fixed effects at the destination-city and origin-county levels. Our findings show that family-oriented migration, on average, significantly promotes entrepreneurship, with a one-unit increase in our index associated with a 20.1% higher likelihood of entrepreneurial engagement. To further validate our results, we construct refined indices that go beyond traditional equal-weighting, incorporating two theoretically grounded dimensions: kinship proximity and age-based economic functionality. These refined

measures reveal that family members with closer kinship ties and greater economic functionality exert stronger positive influences on migrant workers' urban entrepreneurship, demonstrating both the robustness of our coefficient construction across different weighting schemes and the heterogeneous contributions of various family members to entrepreneurial outcomes.

Furthermore, family-oriented migration fosters entrepreneurship by improving migrants' social integration and economic motivation. However, peer effects exert a negative moderating role by weakening the direct impact of family migration on entrepreneurship. Moreover, the interaction between mechanisms reveals that peer effects significantly undermine the effectiveness of these mediating channels, as higher peer effects substantially weaken the positive impact of both social integration and income motivation on entrepreneurial behavior among migrant workers. Taken together, these findings underscore the diverse functions of the family in mitigating risk, consolidating resources, and fostering identity formation, which collectively influence entrepreneurial pathways under institutional constraints.

This study contributes to the literature on family migration and entrepreneurship in China in three important ways. First, prior research has been constrained by significant limitations in measurement approaches. Existing studies typically adopt one of two methodological strategies. The first employs binary indicators that classify migration as either family-oriented or individual-based (Wang & Ding, 2023) or relies on simple counts of co-migrating family members (Hu et al., 2021). This binary approach oversimplifies the complexity of family involvement while neglecting the heterogeneous impacts of different family compositions. The second strategy utilizes discrete categorizations of specific migration types (Wu et al., 2023; Tang et al., 2024). Although this approach offers richer descriptive detail, it constrains econometric modeling flexibility and limits the generalizability of findings across diverse contexts. Furthermore, most research focuses narrowly on nuclear families, overlooking the potential influence of extended kin networks in co-migration processes, and lacking systematic analytical frameworks that compare the differential roles of core versus extended family members in shaping entrepreneurial outcomes (Liu et al., 2019; Hu et al., 2021; Wang & Ding, 2023; Wu et al., 2023). To address these limitations, this study constructs a comprehensive "Family-Oriented Migration Index" that incorporates both traditional equal-weighting and theoretically grounded weighted approaches, with the latter based on two key dimensions: kinship proximity and age-based economic functionality. This approach enables a more accurate and objective measurement of family migration, facilitating a comprehensive analysis of how varying levels of family migration influence migrant entrepreneurship in urban China.

Second, this study advances understanding of the mechanisms linking family migration to entrepreneurship. While previous research has identified roles for emotional support, human capital (Brannon et al., 2013; Hu et al., 2021), and community trust (Herrero, 2018; Liu et al., 2019), this study complements these findings by investigating the mediating effects of social integration and income motivation. More importantly, the analysis introduces the moderating role of peer effects, precisely measured at the destination-city and origin-county intersection, and examines the interactions with the family-oriented migration and these mediating mechanisms. This analytical framework enables more precise identification of the

conditions under which family migration promotes or constrains entrepreneurial activity.

Third, this study addresses substantial data and identification challenges in the literature on family migration and entrepreneurship in China. The research faces significant methodological constraints as few Chinese databases are ideally suited for this topic, particularly those that combine panel structures across multiple waves with detailed records of family members' co-migration patterns. Existing studies based on cross-sectional data (e.g., CLDS) face multiple limitations: not only do they suffer from extremely small sample sizes that allow for fixed effects control only at the provincial level, but they also encounter severe self-selection biases due to their ability to identify only migrants who have already obtained urban hukou status (Hu et al., 2021). To overcome these data limitations, this study employs LLM-based methods to standardize county-level hukou information, expanding the analytical sample to 59,920 observations using CMDS 2017. This approach enables stringent dual fixed effects controls at destination-city and origin-county levels while providing comprehensive information on co-migrating families. The enhanced dataset allows for more rigorous identification strategies that address the omitted variable bias plaguing previous research. Multiple robustness checks—including propensity score matching, placebo tests, and models with stringent fixed effects—confirm the reliability of our findings and provide compelling evidence on the relationship between family-oriented migration and migrant entrepreneurship.

2 Theoretical Analysis and Research Hypotheses

The family embeddedness perspective and the New Economics of Labor Migration (NELM) both emphasize that migration and entrepreneurship decisions are not solely based on individual rational choices, but are instead collective strategic decisions made by families in response to risks and institutional constraints (Stark & Bloom, 1985; Taylor, 1999). These theories provide a crucial theoretical foundation for understanding the phenomenon of migrant worker entrepreneurship in the context of "family-oriented migration".

Building on this foundation, this paper integrates Institutional Theory, Social Capital Theory, Role Identity Theory, and the concept of Shared Mental Models to examine how family migration shapes entrepreneurial behavior by influencing social integration and income growth motivation. Furthermore, this paper explores how peer effects within hometown-based networks moderate these relationships. Figure 1 illustrates the theoretical framework developed in this paper.

2.1 Family-oriented Migration and Entrepreneurship

Drawing on institutional theory, both formal and informal institutions generate exclusionary contexts that restrict resource access (Stephan et al., 2015; Boudreaux et al., 2023). Drawing on social capital theory, the geographic, cultural, and economic isolation accompanying migration erodes traditional social capital (Daly et al., 2023; Huang et al., 2023). This disrupts the local resource and support systems that migrant workers once relied on, thereby hindering their ability to access employment

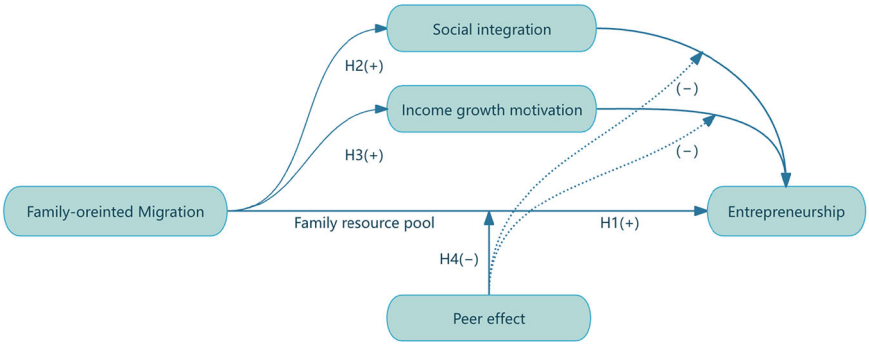

Fig. 1 The role of Family-oriented migration in shaping migrant entrepreneurship: A conceptual framework

opportunities, social support, and entrepreneurial resources in their new urban environments.

Against this backdrop, migrant entrepreneurship emerges as a family-oriented strategy to counteract urban employment instability while meeting family development needs. The relational embeddedness within kinship networks creates a "family resource pool" (Naudé et al., 2017), combining tangible inputs like financial capital and unpaid labor with intangible resources such as information and emotional support (Aldrich & Cliff, 2003; Hu et al., 2021). These pooled resources prove essential for strengthening entrepreneurial capabilities under conditions of urban institutional constraints and social capital reconfiguration. Based on the above analysis, this study proposes the following hypothesis:

H1: The higher the degree of family-oriented migration, the greater the promotion effect on migrant workers' entrepreneurship.

2.2 Family-oriented Migration, Social Integration and Urban Entrepreneurship

Drawing on role identity theory, migration is a process that profoundly disrupts and reorders an individual's set of role-identities (Stryker & Burke, 2000; Madsen & van Naerssen, 2003). Unlike the role-identity discontinuity induced by individual migration, family-based migration creates the conditions for migrants to achieve identity reconstruction in the host city. Family reunification not only reduces the psychological displacement associated with suspended family roles, but more importantly, enables the reconstruction and validation of these essential identities within the new urban context. The integrity of maintaining these multiple identities significantly enhances migrants' subjective well-being and strengthens their sense of belonging and foundational identity as "quasi-citizens" in the host city (Yuanlin et al., 2019; Freitas-Monteiro, 2024; Wang et al., 2025).

Therefore, when an individual's self-concept expands from a singular "laborer" to a composite "family member" and "community resident," this enhanced and stable identity generates positive externalities that reshape their behavioral norms and role cognition. As their sense of belonging and responsibility deepens, migrants become more motivated to seek sustainable livelihood strategies and long-term stability for

their families and communities. This identity transformation naturally channels them toward entrepreneurial pursuits (Horne et al., 2018; d'Adda et al., 2020). For migrant families facing institutional exclusion, entrepreneurship emerges as both a high-risk "identity project" and a strategic response—a rational attempt to contend for social rights, elevate their social status, acquire public resources, and ultimately transition to the higher-prestige social identity of an "urban entrepreneur". Based on the above analysis, this study proposes the following hypothesis:

H2: The degree of family-oriented migration enhances rural migrants' likelihood of engaging in urban entrepreneurship by strengthening their social integration.

2.3 Family-oriented Migration, Income Growth Motivation and Urban Entrepreneurship

While family-oriented migration provides emotional support, it also heightens the economic precarity of migrant households. Structural barriers, such as the hukou system and skill limitations, hinder access to stable, salaried employment for migrants and their relatives, leading to economic insecurity (Cui et al., 2013; Hung, 2022). Concurrently, the migration of dependents, especially children and the elderly, significantly increases household expenditures on housing, education, and healthcare (Rosenzweig & Zhang, 2009). This dual pressure of unstable employment and rising costs, combined with a traditional sense of familial responsibility, creates a powerful motivation for income growth. Consequently, facing limited opportunities in the formal labor market, many migrants turn to entrepreneurship as a key strategy to improve their financial situation, maintain family unity, and achieve upward mobility (Fairlie & Lofstrom, 2015). Based on the above analysis, this study proposes the following hypothesis:

H3: The degree of family-oriented migration promotes rural migrants' urban entrepreneurship by enhancing their household's motivation for income growth.

2.4 The Moderating Role of Peer effects on the Entrepreneurial Outcomes of Family-oriented Migration

Peer effects are a critical social mechanism driving potential entrepreneurs to launch new ventures, primarily by mitigating information barriers and uncertainty (Fornahl, 2003; Bosma et al., 2012a; Bosma et al., 2012b). A substantial body of research confirms that observing peers from similar backgrounds (e.g., hometown or cohort) provides individuals with valuable opportunities to learn entrepreneurial tasks and managerial skills (Nanda & Sørensen, 2010; Chlosta et al., 2012). This vicarious learning also significantly reduces their fear of failure and perceived uncertainty (Minniti, 2005). Through such social interactions, many practical "how-to" questions are answered, directly lowering the start-up costs of new ventures (Wagner & Sternberg, 2004).

However, in the context of urban entrepreneurship among China's migrant workers, their activities are typically embedded in an "involutionary" market environment. This environment is characterized by low entry barriers, fierce homogeneous competition, and diminishing marginal returns. Within this setting, the "feasibility" signals and role models provided by the peer network are overwhelmingly not of high-growth, "opportunity-based entrepreneurship." Instead, they

represent "necessity-based entrepreneurship" or "survival-oriented entrepreneurship," undertaken as an alternative to salaried employment to secure a basic livelihood. Consequently, while the social learning process may stimulate entrepreneurial entry, it also systematically channels new entrants toward saturated and low-profit sectors. We thus propose the following hypothesis:

H4a: Peer effects increase entrepreneurial activity among migrant workers, primarily in necessity-driven ventures.

Furthermore, according to the theory of "Shared Mental Models" (Denzau & North, 2000), a family is not merely a collection of resources but also a cognitive decision-making unit. Internally shared beliefs and values profoundly influence its decisions—that is, its mental model. Confronted with high economic and institutional risks, migrant worker families often develop a shared mental model centered on risk aversion. This mindset is further reinforced by their family culture: a strong sense of family responsibility compels them to prioritize stability and loss minimization, while the process of collective decision-making tends toward conservative consensus, often sacrificing innovation for the sake of security.

When this risk-averse family unit receives negative signals of "involution" from the peer network—such as grueling work hours, meager profits, and relentless competition—its inherent mental model acts as a cognitive filter. Research on vicarious learning suggests that observing the struggles or failures of similar others is particularly salient in shaping risk perceptions. Such exposure can significantly heighten the observer's fear of failure. The family unit therefore selectively amplifies negative information that validates its pre-existing risk concerns, resulting in reluctance to invest valuable internal resources in low-return involutionary ventures. Consequently, the peer effects—which should ideally function as a support network—transform into a suppressive force that erodes the positive efficacy of family resources. We thus propose the following hypothesis:

H4b: Peer effects negatively moderate the positive influence of family-based migration on entrepreneurship among migrant workers.

3 Data, Variables, and Models

3.1 Data

This study utilizes data from the 2017 wave of the China Migrants Dynamic Survey (CMDS), the largest annual cross-sectional survey of China's migrant population conducted by the National Health Commission. The 2017 wave is uniquely suited for our analysis as it is the only year collecting detailed county-level hukou and destination information crucial for our identification strategy, along with comprehensive family migration data. As shown in Fig. 2, the survey achieves extensive national coverage, with migrants originating from across China and residing primarily in major urban centers and economically developed regions[1].

[1] This map is based on the standard map of China, Review No. GS(2023)2767, from the Standard Map Service of the National Administration of Surveying, Mapping and Geoinformation. No modifications were made to the base map.

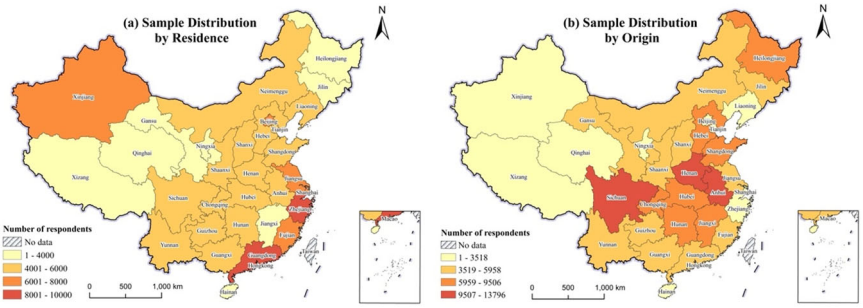

Fig. 2 Sample distribution by residence and origin

The 2017 survey employed a stratified, multi-stage Probability Proportional to Size (PPS) sampling method, with a focus on major urban areas, gathering data on approximately 170,000 migrants and their families. Our final analytical sample was constructed through the following steps: First, we restricted the sample to rural-to-urban migrants by selecting individuals with rural hukou surveyed in urban neighborhood committees. Second, we retained only those who migrated for employment or business purposes, excluding the unemployed. Third, we applied a text analysis approach using Large Language Models to clean and identify non-standardized hukou location texts, significantly improving county-level origin data precision (de Kok, 2025). Finally, single-person households were excluded due to family migration status measurement issues. After these procedures and listwise deletion of missing values, our final sample comprises 59,920 valid observations.

3.2 Variable Measurement and Descriptive Statistics

3.2.1 Dependent Variable

The dependent variables are constructed based on the 2017 China Migrants Dynamic Survey questionnaire, which asks respondents about their employment status: "A. Employee with a fixed employer; B. Worker without a fixed employer; C. Employer; D. Self-employed." To investigate the heterogeneous effects of family-oriented migration, we disaggregate entrepreneurship into two distinct types, creating two separate binary variables for our analysis. Opportunity-driven Entrepreneurship: This variable is coded as 1 for "C. Employer" and 0 for wage-workers (A and B). This category represents proactive engagement based on identified business opportunities, typically leading to firm creation and job generation; Necessity-driven Entrepreneurship: This variable is coded as 1 for "D. Self-employed" and 0 for wage-workers (A and B). This category reflects engagement primarily due to livelihood constraints or a lack of viable wage-employment options.

To validate this classification, we examined the employment structures of the two groups using survey data on the number of paid employees (Q212) and paid kin employees (Q212A). The analysis confirms a sharp distinction: necessity-driven entrepreneurs (the self-employed) reported hiring zero paid employees, consistent

Table 1 Principal Component Analysis (PCA)

Dimension	Variable	Definition	Direction
Identity Recognition	Feel like a local resident	Strongly disagree / Disagree (coded as 0); Basically agree (1); Strongly agree (2)	+
	Feel accepted by local residents		+
	Willingness to integrate locally		+
Willingness to Settle	Intention to stay long term	Willing (coded as 1); Not willing or undecided (coded as 0)	+
	Willingness to obtain urban hukou		+

with the profile of small-scale, non-waged ventures. In contrast, opportunity-driven entrepreneurs (employers) demonstrated significant hiring activity, with a substantial portion hiring non-kin employees and half relying entirely on the external labor market. These clear, theoretically-consistent differences in hiring practices lend strong empirical support to our classification, allowing us to confidently assess the heterogeneous impacts on these distinct entrepreneurial types.

3.2.2 Independent Variable

The degree of family-oriented migration is measured by the proportion of household members residing in the destination area relative to the total number of household members. This indicator reflects the extent to which the family unit has migrated. The calculation formula is as follows:

$$Family\_migration_{equal\_weighted} = \frac{N_{\text{local\_kin}} + 1}{N_{\text{total\_kin}} + 1} \tag{1}$$

Where $Family\_migration_{equal\_weighted}$ represents an equal-weighted composite index of family-oriented migration components calculated for each respondent. N_{local_kin} is the total number of kin (family members other than the respondent) who co-reside with the respondent in the destination city. N_{total_kin} is the total number of kin identified for the respondent, regardless of their location.

3.2.3 Mechanism Variables: Social Integration, Income Growth Motivation, and Peer effects

Social Integration is measured based on the CMDS 2017 questionnaire design. Principal Component Analysis (PCA) derives an index from two dimensions: identity recognition and willingness to settle (see Table 1). The KMO value is 0.692, indicating the data is suitable for factor analysis. Two components have eigenvalues greater than 1 (2.288 and 1.090, respectively). Since the factor scores extracted from the principal component analysis (PCA) contain negative values, this paper applied a non-negativity transformation by uniformly adding the absolute value of the minimum score to all observations. This adjustment does not affect the substantive interpretation of the regression results. To ensure the robustness of the results, this

paper also removed the "undecided" responses and re-conducted the principal component analysis.

Income growth motivation is assessed by the ratio of a household's average monthly expenditure to its monthly income, reflecting the pressure or incentive to increase income. The data is winsorized at the 1% level on both tails to reduce the influence of outliers. To further examine the mechanism from the perspective of income growth outcomes, annual household income is calculated by multiplying the reported "average monthly household income last year" by 12, and a log transformation is applied after adding 1.

To capture peer effects, we construct a reference group variable that measures peer influences within an individual's reference group. This paper defines the reference group by combining geographic proximity (residing in the same prefecture-level city) and social origin (sharing the same hukou county/district). The peer effect variable measures the average entrepreneurship rate among all reference group members, excluding individual i. This leave-one-out construction eliminates the mechanical correlation between the individual's entrepreneurial behavior and the group average, thereby enabling more precise identification of social interaction and imitation effects stemming from the group context. The variable is calculated as follows:

$$Peer\_effect_{ich} = \frac{\sum_{j \neq i, j \epsilon G_{ch}} \text{is\_entrepreneur}_j}{N_{ch} - 1} \tag{2}$$

Where $Peer\_effect_{ich}$ represents the entrepreneurship rate perceived by individual i (residing in city c and registered in county h) among peers. G_{ch} denotes the reference group consisting of individuals who live in city c and share the same hukou registration in county h as individual i. is_entrepreneur_j is a dummy variable equal to 1 if group member j is an entrepreneur, and 0 otherwise. N_{ch} is the total number of individuals in the reference group G_{ch}. $\sum_{j \neq i, j \epsilon G_{ch}} \text{is\_entrepreneur}_j$ denotes the total number of entrepreneurs in the reference group G_{ch}, excluding individual i.

3.2.4 Control Variables

This study includes two categories of control variables: individual characteristics and migration characteristics. Individual characteristics include political affiliation, age, age squared, gender, educational attainment, marital status, and self-rated health status. Migration characteristics include duration of migration and migration scope. The definitions of all variables are presented in Table 2[2].

Regarding the independent variable, the sample consists of 59920 cases of family-oriented migration. Among them, 38013 households had all members migrate to the destination, indicating complete family migration, which accounts for 63.4% of the total sample. It is important to note that this figure is derived from our main analytical sample, which excludes single-person households due to potential underreporting of non-migrating family members. A robustness check incorporating single-person households further confirms the absolute dominance of the whole-family migration

[2] The missing values in the peer-effect sample are primarily due to the presence of aggregated "municipal district" codes in the hukou county/district data, which are not disaggregated into specific district names. As a result, accurate matching could not be achieved.

Table 2 Descriptive statistics

Variable Name	Definition	Obs	Mean	Min	Max
Entrepreneurship	Coded as 1 if self-employed or employer; 0 otherwise	59920	0.501	0.000	1.000
Necessity entrepreneurship	Coded as 1 if self-employed; 0 otherwise	55623	0.463	0.000	1.000
Opportunity entrepreneurship	Coded as 1 if employer; 0 otherwise	34184	0.126	0.000	1.000
Family-oriented migration	Proportion of migrating family members to total household size	59920	0.826	0.100	1.000
Social integration	Measured by PCA	59920	1.808	0.000	3.499
Social integration2	removing "undecided" responses	39059	2.603	0.567	4.067
Income growth motivation	Household average monthly expenditure divided by average monthly income	59915	0.577	0.023	10.000
Annual household income	Log (annual average income + 1)	59874	11.233	0.000	14.691
Peer effects	Mean entrepreneurship rate of peers (leave-one-out)	45281	0.491	0.000	1.000
Gender	Male = 1; Female = 0	59920	0.591	0.000	1.000
Age	2017 minus year of birth	59920	37.468	16.000	79.000
Age squared	Age squared divided by 100	59920	1489.235	256.000	6241.000
Education	Coded as 1 if junior college and above; 0 otherwise	59920	0.116	0.000	1.000
Political affiliation	Communist Party member = 1; Non-member = 0	59920	0.038	0.000	1.000
Marriage	Never married, divorced, widowed = 0; Married, remarried, cohabiting = 1	59920	0.941	0.000	1.000
Self-rated health	Healthy = 1; Basically healthy = 2; Unhealthy = 3	59920	1.190	1.000	3.000
Migration scope	Inter-provincial = 1; Inter-city within province = 2; Inter-county within city = 3	59920	1.717	1.000	3.000
Duration of migration	Survey year minus the year of arrival in the current location	59920	6.746	0.000	56.000

model, with the rate of complete family migration remaining substantial at 55%, which is consistent with existing research (Wu et al., 2023).

Regarding the dependent variable, 50.1% of migrant workers engage in entrepreneurial activities in cities, indicating that entrepreneurship has become a significant employment form for this population. Breaking this down by type, 46.3% pursue necessity-driven entrepreneurship, while 12.6% undertake opportunity-driven entrepreneurship. This pattern reveals that migrant entrepreneurship in urban areas is predominantly necessity-driven, with relatively limited opportunity-driven entrepreneurship. Furthermore, as shown in Fig. 3, when family migration is categorized into complete versus partial patterns, the data show consistently higher entrepreneurship rates across all categories—overall, necessity-driven, and opportunity-driven—among migrants with complete family migration. These findings indicate that the extent of family migration is strongly associated with entrepreneurial engagement among urban migrants.

3.3 Model Specification

To examine the relationship between family-oriented migration and migrant entrepreneurship, we employ the following regression specifications:

3.3.1 A Two-way Fixed effects OLS Model Based on Cross-Sectional Data

To effectively control for potential omitted variable bias, our model incorporates two sets of fixed effects simultaneously: one for the prefecture-level city of residence and another for the county/district level of household registration. Based on this identification strategy, this study employs an OLS regression framework implemented via the *reghdfe* command. The Linear Probability Model (LPM) is chosen due to its analytical convenience—it allows for the inclusion of multiple fixed effects and their interactions, and its coefficients are straightforward to interpret. Accordingly, we estimate the model using OLS with dual fixed effects for both the place of residence and hukou origin, the strategy of estimating binary outcome variables using a Linear Probability Model (LPM) is widely adopted in leading economics journals (Fisman et al., 2020; Hoopes et al., 2022). The specific model is as follows:

$$Is\_entrepreneur_{ich} = \alpha_0 + \gamma_1 Family\_migration_i + \gamma_2 cv_i + City_c + Hukou_h + \varepsilon_i \tag{3}$$

In Eq. (3), $Is\_entrepreneur_{ich}$ is the dependent variable, indicating whether migrant worker i, residing in city c originating from hukou county h, engages in entrepreneurial activity. $Family\_migration_i$ denotes the degree of family-oriented migration at the household level for individual i. cv_i represents a vector of individual-level control variables, including personal characteristics and migration-related factors. We include both city ($City_c$) and origin county ($Hukou_h$) fixed effects to account for unobserved heterogeneity across destination cities and migrants' hukou-registered counties of origin.

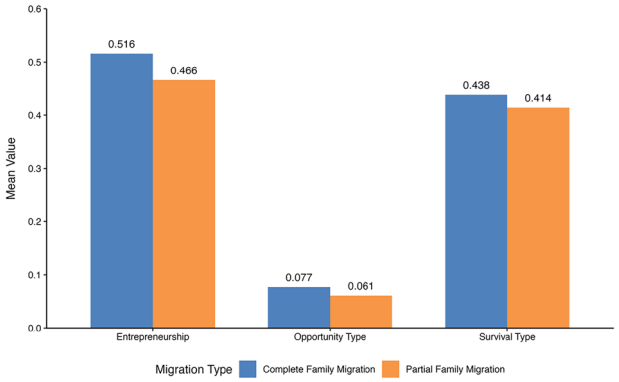

Fig. 3 Entrepreneurship rates by family migration type

3.3.2 Propensity Score Matching

To further identify the causal effect of family-oriented migration on entrepreneurship, this study adopts Propensity Score Matching (PSM) to conduct a counterfactual analysis. Based on the core principle of PSM, individuals are divided into a treatment group and a control group according to their degree of family-oriented migration. The probability of entering the treatment group, conditional on observable characteristics Z_i, is estimated as follows:

$$P(Z_i) = \Pr(D = 1|Z_i) \tag{4}$$

Next, individuals in the control group are matched to those in the treatment group based on proximity in propensity scores, ensuring similarity in covariates between the two groups. The counterfactual outcomes for the treated units are then simulated using matched controls, and the average treatment effect on the treated (ATT) is calculated as:

$$ATT = E(Y\_i|D = 1, P(Z_i)) - E(Y_i|D = 0, P(Z_i)) \tag{5}$$

3.3.3 Mediation effect Model

This study further examines the mediating roles of income growth motivation and social integration to investigate the underlying mechanisms through which family-oriented migration affects entrepreneurial behavior. The following models are estimated:

$$Median_{ich} = \alpha_0 + \beta_1 Family\_migration_{ic} + \beta_2 cv_i + City_c + Hukou_h + \varepsilon_i \tag{6}$$

$$\begin{aligned} Is\_entrepreneur_{ich} = {} & \alpha_0 + \gamma_1 Family\_migration_i + \gamma_2 Median_i \\ & + \gamma_3 cv_i + City_c + Hukou_h + \varepsilon_i \end{aligned} \tag{7}$$

In these equations, $Median_i$ denotes the mediating variable. Equation (6) assesses the effect of family-oriented migration on the mediator, where β_1 is the corresponding coefficient. Equation (7) evaluates the effect of the mediator on entrepreneurial behavior while controlling for family-oriented migration and other covariates.

The coefficients of interest are β_1 and γ_2. If both coefficients are significantly positive, it provides empirical support for Hypotheses H2-H3, confirming the presence of mediation effects.

3.3.4 Peer Effects Moderation Model

To further explore whether the impact of family-oriented migration on entrepreneurial behavior varies depending on peer effects, specifically whether migrant workers from the same hukou county or district reside in the same city, we introduce a moderation model.

$$\begin{aligned} Is\_entrepreneur_{ich} = {} & \alpha_0 + \gamma_1 Family\_migration_i + \gamma_2 Peer\_effect_{ich} \\ & + \gamma_3 Peer\_effect_{ich} \times Family\_migration_i \\ & + \gamma_4 cv_i + city_c + Hukou_h + \varepsilon_i \end{aligned} \tag{8}$$

Here, $Peer\_effect_{ich}$ denotes the moderating variable representing peer influence. The interaction term $Peer\_effect_{ich} \times Family\_migration_i$ captures how peer effects may moderate the influence of family-oriented migration on entrepreneurship. The primary focus is on the coefficient γ_3, if the coefficient is statistically significant, this suggests the existence of a moderating effect.

4 Empirical Analysis

4.1 Baseline Regression Analysis

Controlling for city fixed effects and Hukou County FE, we progressively include individual, household, and migration-related control variables in the regression model. The estimation results are presented in Table 3. The coefficient of family-oriented migration is consistently positive and statistically significant at the 1% level across all model specifications, indicating that a higher degree of family-oriented migration increases the likelihood of urban entrepreneurship among migrant workers, thereby supporting Hypothesis 1. Using Column (3) as the baseline and controlling for all other variables, each unit increase in family-oriented migration raises the likelihood of migrant entrepreneurship by an average of 20.1%.

Columns (4) and (5) use necessity-driven and opportunity-driven entrepreneurship, respectively, as dependent variables. The results show that family-oriented migration positively affects both types of entrepreneurship, with a more pronounced impact on necessity-driven entrepreneurship. This finding can be explained by the unique advantages of family-based labor. By providing low-cost, trusted, and flexible workers, family involvement significantly reduces operational costs and transaction risks (Rath & Swagerman, 2016). These benefits are especially critical in necessity-driven sectors like retail and services, where business models are built upon stringent cost control and resilience. The natural alignment between the strengths of family labor and the core demands of such ventures makes it a particularly powerful driver for necessity-driven entrepreneurship (Bird & Wennberg, 2016; Kraus et al., 2018).

Table 3 Baseline regression results

	(1) Entrepreneur	(2) Entrepreneur	(3) Entrepreneur	(4) Necessity	(5) Opportunity
Family_migration	0.199*** (0.008)	0.211*** (0.008)	0.201*** (0.008)	0.195*** (0.008)	0.083*** (0.007)
Gender		0.007** (0.004)	0.006 (0.004)	−0.007* (0.004)	0.027*** (0.004)
Age		0.027*** (0.002)	0.023*** (0.002)	0.020*** (0.002)	0.014*** (0.001)
Age squared		−0.000*** (0.000)	−0.000*** (0.000)	−0.000*** (0.000)	−0.000*** (0.000)
Education		−0.183*** (0.006)	−0.178*** (0.006)	−0.192*** (0.006)	−0.038*** (0.005)
Political affiliation		−0.061*** (0.009)	−0.061*** (0.009)	−0.070*** (0.009)	−0.003 (0.008)
Marriage		0.125*** (0.008)	0.124*** (0.008)	0.116*** (0.008)	0.048*** (0.006)
Self-rated health		−0.002 (0.005)	−0.005 (0.005)	0.000 (0.005)	−0.019*** (0.004)
Migration scope			−0.039*** (0.004)	−0.043*** (0.004)	−0.042*** (0.004)
Duration of migration			0.007*** (0.000)	0.006*** (0.000)	0.005*** (0.000)
_cons	0.336*** (0.007)	−0.335*** (0.029)	−0.199*** (0.029)	−0.159*** (0.030)	−0.179*** (0.024)
City FE	√	√	√	√	√
Hukou County FE	√	√	√	√	√
N	59920	59920	59920	55594	34040
Adj. R^2	0.200	0.234	0.240	0.258	0.152

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Robust standard errors are reported in parentheses.

4.2 Sensitivity Analysis of the "Family-Based Migration Index" Based on Weighted Adjustments

The core explanatory variable of this study—the "Family-Based Migration Index"—is initially constructed using a conventional equal-weighting approach. However, this method fails to account for the heterogeneous contributions of different family members, such as variations in kinship proximity or economic functionality. This limitation may obscure important intra-household dynamics that influence migration behavior. To ensure that the core findings of this study are not driven by a specific index construction method, and to systematically address potential measurement bias, this paper conducts a series of sensitivity analyses based on two theoretically grounded dimensions: kinship identity and economic functionality. These analyses aim to assess how different weighting schemes along these two dimensions affect the estimated results.

4.2.1 Sensitivity Test I: Weighting Based on "Core vs. Non-Core" Kinship Identity

This paper classifies family members into two categories based on the closeness of kinship ties. The first category includes core relatives such as spouses, children, and parents, while the second category consists of other relatives including grandparents, grandchildren, and siblings. Nine different weighting combinations are tested, ranging from a 10/90 to a 90/10 ratio between core and non-core relatives. The general formula for the weighted index is as follows:

$$Family\_migration_{kinship\_weighted} = \frac{(L_1 \times w_1) + (L_2 \times w_2) + w_1}{(N_1 \times w_1) + (N_2 \times w_2) + w_1} \tag{9}$$

where N_1 and L_1 denote the total number and the number of local core relatives, respectively; N_2 and L_2 refer to the same for non-core relatives. w_1 and w_2 are the assigned weights for each category, with $w_1 + w_2 = 1$. The respondent's weight is always aligned with that of core relatives.

However, given the structural characteristics of the sample, two issues arise. First, 93.8% of households are "pure core families," meaning they contain only core relatives. Second, in many mixed households, migration patterns tend to be homogeneous (i.e., all members are local or non-local). As a result, changes in weighting schemes have no substantive effect on the index value, leading to only minor fluctuations in the estimated coefficients. This makes it difficult to measure and assess the impact of non-core family members' weights on the estimation results. To better capture this heterogeneity, we adopt two analytical strategies:

1. We conduct weighted regressions based on the proportional distribution of three household types: pure core families (58,116 households, 93.80%), pure non-core families (880 households, 1.42%), and mixed families (2962 households, 4.78%). The results of the sensitivity analysis are visualized in Fig. 4.
2. We perform subsample regressions using only the 2962 mixed-family households. Due to sample size limitations, fixed effects are controlled at the city level. Figure 5 presents the visualization of the sensitivity analysis results.

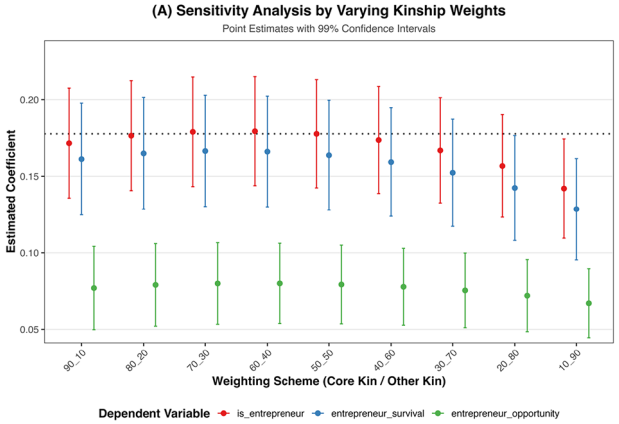

Fig. 4 Sensitivity analysis by varying kinship weights (**A**). The different colored markers represent the results for three distinct dependent variables. Red markers denote the outcome for overall entrepreneurship (is_entrepreneur), blue for necessity-driven entrepreneurship (entrepreneur_survival), and green for opportunity-driven entrepreneurship (entrepreneur_opportunity)

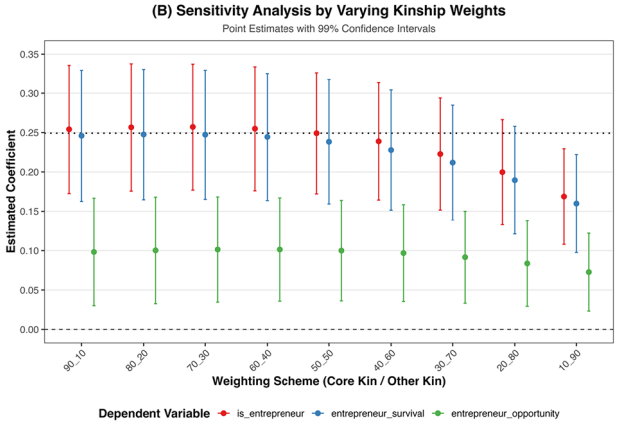

Fig. 5 Sensitivity analysis by varying kinship weights (**B**). The different colored markers represent the results for three distinct dependent variables. Red markers denote the outcome for overall entrepreneurship (is_entrepreneur), blue for necessity-driven entrepreneurship (entrepreneur_survival), and green for opportunity-driven entrepreneurship (entrepreneur_opportunity)

Both strategies of results reveal a consistent pattern: when the weight assigned to core family members is 50% or higher, the positive effect of family-based migration on entrepreneurship remains stable. However, as the weight of core members decreases (from 40 to 10%), the promotive effect of family-based migration—particularly on necessity-driven entrepreneurship—declines significantly. These findings underscore the critical role of core relatives in facilitating migrant entrepreneurship in urban areas.

4.2.2 Sensitivity Test II: Weighting Based on "Economic Functionality"

We further construct an alternative weighting scheme based on the economic functionality of family members. Given that entrepreneurship typically requires substantial time and energy investment, whether co-migrating family members are economically dependent (under 18 or over 60) or economically active (aged 18–59) may have differential impacts on entrepreneurial decisions. Accordingly, we test nine weighting combinations, ranging from a 10/90 to a 90/10 ratio between dependent and non-dependent members. The general formula for the age-weighted index is as follows:

$$Family\_migration_{age\_weighted} = \frac{(L_D \times w_D) + (L_{ND} \times w_{ND}) + w_D}{(N_D \times w_D) + (N_{ND} \times w_{ND}) + w_D} \tag{10}$$

where N_D represents the total number of dependent members, L_D represents the number of local dependent members, N_{ND} represents the total number of non-dependent members, and L_{ND} represents the number of local non-dependent members. w_D and w_{ND} are the assigned weights, with $w_D + w_{ND} = 1$.

The results of this sensitivity analysis are presented in Fig. 6. Empirical findings reveal a strikingly consistent and monotonic pattern: as the weight assigned to dependent members decreases, the promotive effect of family-based migration on entrepreneurship—especially necessity-driven entrepreneurship—becomes significantly stronger. This result not only reinforces the robustness of our main findings but also provides new theoretical insights into why family-oriented migration influences entrepreneurship, particularly from the perspective of household economic functionality.

5 Mechanism Analysis

5.1 Social Integration

Table 4 presents the results of the mediation analysis that examines the role of social integration. Column (1) indicates a significant positive relationship between family-oriented migration and migrant workers' social integration at the 1% level. Column (2) includes social integration in the baseline regression, showing that family-oriented migration and social integration have significant, positive effects on entrepreneurship.

Furthermore, we tested the robustness of our social integration indicator. After removing "undecided" responses and reconstructing the index via principal component analysis, the mediating effect remains robust, as shown in Columns (3) and (4). These results indicate that family-oriented migration promotes migrant workers' entrepreneurship in cities by enhancing social integration. Therefore, Hypothesis 2 is fully supported.

5.2 Income Growth Motivation

We further explore the income growth motivation mechanism underlying the family migration-entrepreneurship relationship. In Table 5, Column (1) shows that family

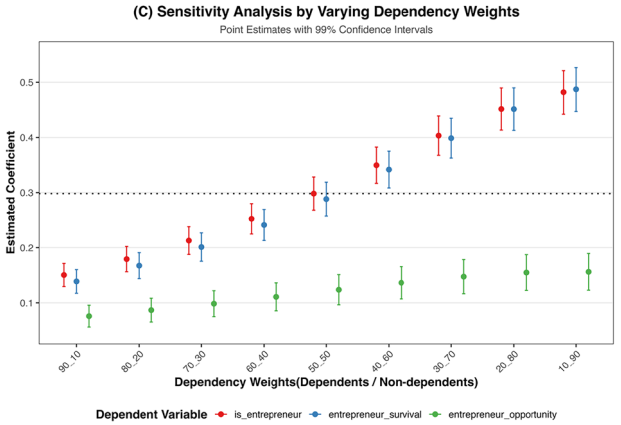

Fig. 6 Sensitivity analysis by varying dependency weights (**C**). The different colored markers represent the results for three distinct dependent variables. Red markers denote the outcome for overall entrepreneurship (is_entrepreneur), blue for necessity-driven entrepreneurship (entrepreneur_survival), and green for opportunity-driven entrepreneurship (entrepreneur_opportunity)

Table 4 Family-oriented migration and social integration

	(1) Social integration	(2) Entrepreneur	(3) Social integration2	(4) Entrepreneur
Family migration	0.260*** (0.015)	0.199*** (0.008)	0.289*** (0.019)	0.204*** (0.010)
Social integration		0.010*** (0.002)		
Social integration2				0.010*** (0.002)
_cons	0.795*** (0.056)	−0.206*** (0.029)	1.487*** (0.073)	−0.238*** (0.038)
Controls	√	√	√	√
City FE	√	√	√	√
Hukou County FE	√	√	√	√
N	59920	59920	38934	38934
Adj. R^2	0.166	0.241	0.175	0.231

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Robust standard errors are reported in parentheses

migration significantly increases income growth motivation at the 1% level, indicating that greater family migration completeness is associated with stronger income-enhancement motives. Column (2) reports the regression results incorporating income growth motivation into the baseline model.

To examine this mechanism through actual income outcomes, we calculate annual household income by multiplying reported "average monthly household income last year" by 12, applying a log transformation after adding 1. Columns (3) and (4) report regression results using log annual household income as the mediating variable. These results demonstrate that family migration elevates household expenditure and strengthens migrants' income-enhancement motivation through entrepreneurial engagement, thereby providing empirical support for Hypothesis 3.

Table 5 Family-oriented migration and income growth motivation

	(1) Income motivation	(2) Entrepreneur	(3) Annual household income	(4) Entrepreneur
Family migration	0.031*** (0.005)	0.200*** (0.008)	0.172*** (0.011)	0.189*** (0.008)
Income motivation		0.055*** (0.006)		
Annual household income				0.071*** (0.005)
_cons	0.226*** (0.021)	−0.211*** (0.029)	10.922*** (0.045)	−0.978*** (0.059)
Controls	√	√	√	√
City FE	√	√	√	√
Hukou County FE	√	√	√	√
N	59915	59915	59874	59874
Adj. R^2	0.069	0.241	0.164	0.248

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Robust standard errors are reported in parentheses

Table 6 The impact of peer effects on entrepreneurship

	(1) Entrepreneurship	(2) Opportunity	(3) Necessity	(4) Hometown Chamber
c.Family migration×c.Peer_effect	−0.070*** (0.024)	0.059** (0.026)	−0.038 (0.025)	
Peer_effect	0.076*** (0.022)	−0.073*** (0.022)	0.065*** (0.022)	
Family migration	0.242*** (0.015)	0.055*** (0.011)	0.221*** (0.015)	0.016*** (0.003)
Controls	√	√	√	√
City FE	√	√	√	√
Hukou County FE	√	√	√	√
N	45281	25960	42213	59920
Adj. R^2	0.227	0.135	0.245	0.050

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Robust standard errors are reported in parentheses

5.3 Peer effects

5.3.1 Moderating the Entrepreneurial Promotion effect of Family-Oriented Migration

Before examining the moderating effect of peer influence on the relationship between family-oriented migration and entrepreneurship, this study first verifies whether family-oriented migration strengthens migrants' ties to hometown networks. To this end, we use the survey question "Q501E: Have you participated in activities organized by your hometown chamber of commerce in this locality?" to measure migrants' integration into this key peer network. In Table 6, the regression results

(Column 4) show that family-oriented migration significantly increases the likelihood of participating in hometown chamber of commerce activities. This indicates that a higher degree of family-oriented migration is associated with deeper integration into hometown organizational networks, thereby increasing exposure to peer effects. This finding provides a solid empirical foundation for our subsequent moderation analysis.

Furthermore, Columns (1)-(3) show that peer effects have a significant positive impact on overall entrepreneurship after controlling for the main explanatory variables and interaction terms. However, this positive effect is primarily driven by necessity entrepreneurship, whereas peer effects significantly inhibit opportunity entrepreneurship. These findings confirm the underlying mechanism of peer effects and provide full support for Hypothesis H4a.

Regarding the moderating effect of peer influence, the results for the interaction term in Column (1) indicate that peer effects significantly weaken the positive impact of family-oriented migration on entrepreneurship. Further analysis shows that, as reported in Column (2), the interaction term has a significantly positive effect on opportunity entrepreneurship, while its effect on necessity entrepreneurship is not significant, as shown in Column (3).

Specifically, when the information transmitted by the hometown network interacts with the household's resource endowment and risk preferences, it exerts differentiated effects on entrepreneurial choices. When networks predominantly reinforce necessity entrepreneurship messages, this creates a discouraging effect. Even households with high family migration levels, who might otherwise have greater motivation and resources, become more cautious about entering saturated, low-return sectors. The prevalence of such information amplifies their risk perceptions and tempers the positive impact of family-oriented migration on necessity entrepreneurship. Conversely, if the hometown network conveys information about high-quality, opportunity-driven entrepreneurship, family-oriented migrant households with sufficient resources are more likely to leverage their advantages and pursue these valuable opportunities, reflecting a mechanism of "strategic choice". Overall, since necessity entrepreneurship dominates the sample, this ultimately leads to a net "inhibitory" effect of peer influence on overall entrepreneurial activity. These findings provide empirical support for H4b.

5.3.2 Moderating effects with Social Integration and Income Motivation

From a theoretical perspective, within the collective decision-making framework of family-based migration, peer effects exert critical influence at the final decision-making stage of entrepreneurship—specifically moderating the pathway from motivational mechanisms to entrepreneurial outcomes. While families may develop entrepreneurial motivations through income improvement aspirations or social integration needs, the translation of these motivations into actual entrepreneurial behavior is significantly influenced by peer networks during the final decision phase. Migrant families rely heavily on peer observations and comparisons for risk assessment when facing uncertain entrepreneurial choices. Therefore, peer effects serve as a moderator in the mechanism-to-outcome pathway of family entrepreneurial decision-making. We re-estimate the extended model to test whether peer effects

moderate the role of other mechanisms as follows:

$$\begin{aligned} Is\_entrepreneur_{ich} = {} & \alpha_0 + \alpha_1 family\_migration_i + \alpha_2 peer\_high_{ich} \\ & + \alpha_3 mediator_i + \alpha_4 (mediator_i \times peer\_high_{ich}) \\ & + \alpha_5 cv_i + city_c + Hukou_h + \varepsilon_i \end{aligned} \tag{11}$$

where $mediator_i$ denotes either social integration or income motivation, and $peer\_high_{ich}$ represents peer influence (which this paper operationalizes as a binary variable, coded 0 or 1, based on the median split). This specification allows us to examine whether peer effects moderate the effects of social integration and income motivation on entrepreneurial decisions. This paper conducts separate tests for social integration and income motivation, rather than including them in the same model, to avoid multicollinearity and facilitate clearer interpretation.

The results in columns (1)–(4) of Table 7 show that the interaction terms between peer effects and social integration (including its robustness check variable: Social Integration2), as well as income motivation (and its robustness check variable: Annual Household Income), are all significantly negative at the 1% level. This indicates that higher peer effects significantly weaken the positive impact of social integration and income motivation on entrepreneurial behavior among migrant workers.

6 Robustness Checks

6.1 Propensity Score Matching Method

To ensure the robustness of the results, this study employs the Propensity Score Matching (PSM) method to construct a counterfactual framework that simulates a quasi-natural experiment. As shown in Fig. 7, the balance test indicates significant differences between the treatment and control groups prior to matching. However, after matching, the differences in covariates between the two groups become statistically insignificant. Moreover, the mean bias after matching is significantly reduced, and all covariate biases are below the 10% threshold, suggesting that matching has effectively minimized the imbalance between the treatment and control groups. Overall, the quality of the matching is satisfactory.

The common support assumption is illustrated in Fig. 8, which shows that the treatment and control groups fall within a similar range of propensity scores after matching, with very few observations lost due to lack of overlap. This indicates that the PSM method has achieved a good level of covariate balance, suggesting that apart from differences in the degree of family-oriented migration, the two groups are highly similar in other observable characteristics. As a result, this enhances the credibility of estimating the net effect of family-oriented migration on migrant entrepreneurship.

After satisfying the common support and covariate balance assumptions, this study estimates the Average Treatment Effect on the Treated (ATT) to assess the impact of family-oriented migration on migrant entrepreneurship. The matching results are presented in Table 8, where the ATT estimates obtained from the three

Table 7 Interaction of mechanisms

	(1) Entrepreneur	(2) Entrepreneur	(3) Entrepreneur	(4) Entrepreneur
1.Peer_high#c.Social integration	−0.031*** (0.005)			
1.Peer_high#c.Social integration 2		−0.041*** (0.006)		
1.Peer_high#c.Income motivation			−0.032** (0.014)	
1.Peer_high#c.Annual household income				−0.044*** (0.011)
Social integration	0.026*** (0.004)			
Social integration2		0.031*** (0.004)		
Income motivation			0.073*** (0.012)	
Annual household income				0.104*** (0.010)
Peer_high	0.045*** (0.011)	0.081*** (0.018)	0.006 (0.011)	0.482*** (0.128)
Family migration	0.205*** (0.009)	0.206*** (0.011)	0.207*** (0.009)	0.194*** (0.009)
_cons	−0.273*** (0.035)	−0.307*** (0.046)	−0.256*** (0.035)	−1.374*** (0.116)
Controls	√	√	√	√
City FE	√	√	√	√
Hukou County FE	√	√	√	√
N	45281	29673	45276	45247
Adj. R^2	0.228	0.220	0.228	0.236

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Robust standard errors are reported in parentheses

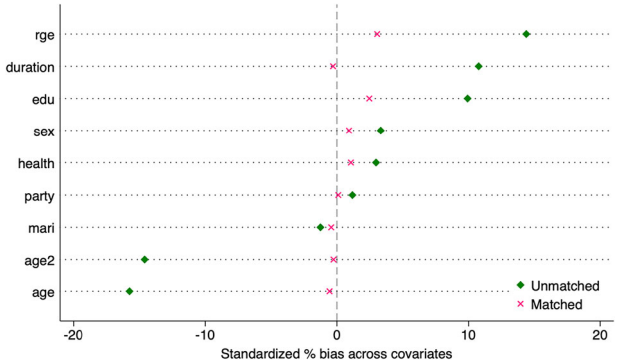

Fig. 7 Covariate balance test

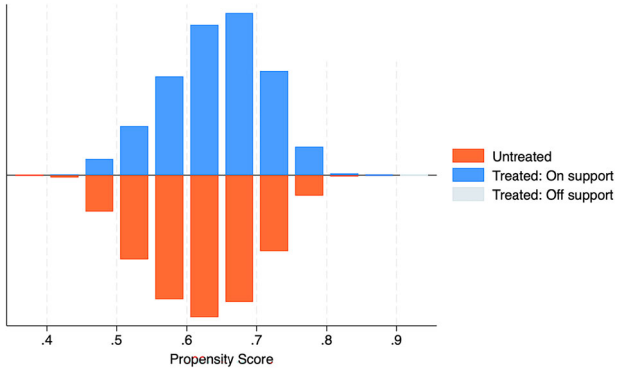

Fig. 8 Common support test

Table 8 Propensity score matching estimates using different matching methods

Matching Method	Treated Group	Control Group	ATT	Std. Error	t-value
Nearest Neighbor Matching (1:1)	0.5160	0.4695	0.0464***	0.0090	5.27
Radius Matching (Caliper = 0.05)	0.5160	0.4715	0.0444***	0.0044	10.18
Kernel Matching	0.5160	0.4712	0.4477***	0.0044	10.26

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Robust standard errors are reported in parentheses

different matching methods are relatively consistent and statistically significant at the 1% level. These findings align with the results from the baseline regression, indicating that the conclusions of this study are robust.

6.2 Further Robustness Checks

This paper conducts additional sensitivity analyses to further validate the robustness of our main findings. Table 9 presents the results of these supplementary robustness

Table 9 Supplementary robustness tests

	(1) Controlling for Place-of-Origin Effects	(2) Excluding Short-Term Migrants	(3) Excluding Major Cities	(4) FEIS	(5) Dual County FE
Family Migration	0.228*** (0.009)	0.153*** (0.011)	0.189*** (0.010)	0.200*** (0.009)	0.188*** (0.008)
Homestead Land Ownership	0.000 (omitted)				
Dividends from Collective Economy	0.018 (0.013)				
Area of Homestead Land	0.000*** (0.000)				
Constant	−0.196*** (0.035)	−0.145*** (0.049)	−0.104*** (0.039)	−0.027 (0.191)	−0.185*** (0.030)
Controls	√	√	√	√	√
City FE	√	√	√	×	×
Hukou County FE	√	√	√	×	√
City County FE	×	×	×	×	√
City FE-Hukou FE	×	×	×	√	×
N	42664	31768	33957	53963	58721
Adj. R^2	0.261	0.239	0.275	0.233	0.283

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Robust standard errors are reported in parentheses

checks. First, although county-level fixed effects of migrants' registered residence areas have been controlled to further account for observable heterogeneity within counties, the model incorporates several key variables to mitigate potential selection bias arising from differences in sending areas. Specifically, the model includes whether the household owns homestead land in the place of origin (coded as 1 if yes, 0 otherwise), the actual area of the homestead land, and whether the household receives dividends from collective economic organizations. These variables allow for a more accurate assessment of how resource endowments and economic foundations in the place of origin influence family-oriented migration decisions. As shown in Column (1), the coefficient of the key explanatory variable remains significant, and the main findings are robust.

Second, this study excludes individuals who have resided in the destination city for less than five years. Short-term migrants are often in a state of flux, still adapting to the urban environment with uncertain long-term prospects for their careers, family settlement, and choice of location. Pooling short-term and long-term migrants in the same analysis may introduce confounding effects, thereby undermining the validity of identifying the impact of family-oriented migration on entrepreneurial behavior. Therefore, we re-estimate the model after excluding this subgroup. As shown in Column (2), the coefficient remains significantly positive at the 1% level, further confirming the robustness of the main findings.

Third, to account for the confounding effect of favorable entrepreneurial conditions in major cities, we re-run our analysis on a subsample that excludes centrally-administered municipalities and provincial capitals. Prior studies note that urban scale is a key driver of migrant entrepreneurship (Yu et al., 2017). The results, presented in Column (3), show that the positive effect of family-oriented migration remains statistically significant at the 1% level, which supports the robustness of our core conclusion.

Finally, a core challenge to our analysis is unobserved structural heterogeneity. Specifically, the unique economic, cultural, and social network ties between any given origin and destination may act as confounding factors, and these are difficult to control for directly in a cross-sectional framework. To address this challenge, we construct an origin-destination pair fixed-effects model to absorb all unique, unobserved common factors within each specific migration corridor (Rüttenauer & Ludwig, 2023). We implement this pairing at the prefecture level rather than the county level to avoid a severe loss of degrees of freedom. As shown in Column (4), the coefficient of our key explanatory variable remains significant under this model, providing initial evidence of our finding's robustness. Furthermore, to assess the sensitivity of the baseline results to the specification of city fixed effects, we replace the prefecture-level city fixed effects with more fine-grained county-level fixed effects. As reported in Column (5), the coefficient and statistical significance of the key explanatory variable remain robust, further confirming the stability of the main findings.

6.3 Placebo Test

To verify that unobserved confounding factors do not drive our estimated effect, we conduct a placebo test. Specifically, we randomly reassign the values of the degree of

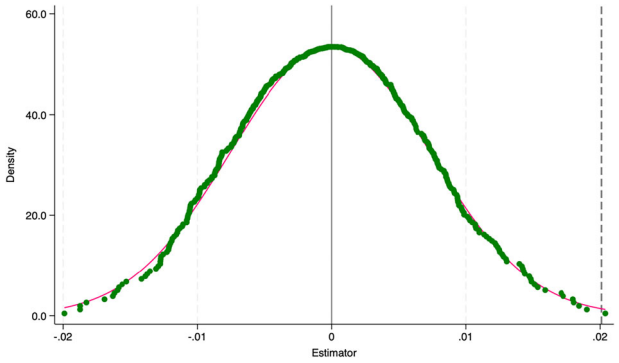

Fig. 9 Placebo test

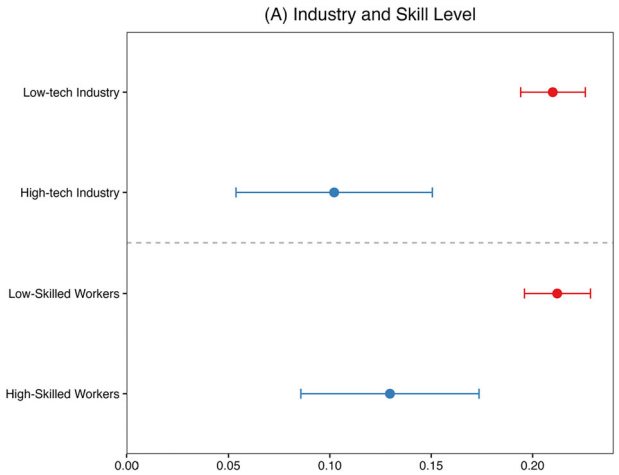

Fig. 10 Heterogeneous effects by industry type and skill level. Note: Coefficients and 95% confidence intervals for the family migration variable. The same format applies to the following figures

family migration across all observations and re-estimate the baseline model with this randomized variable. We repeat this procedure 500 times and plot the distribution of the resulting "placebo" coefficients. Figure 9 visualizes the placebo test results, where the distribution of placebo coefficients is bell-shaped and centered at zero. However, the actual coefficient from our baseline model is a clear outlier located in the extreme tail of this distribution.

7 Heterogeneity Analysis

7.1 Industry Type and Skill Level

Following the National Industry Classification Standard (GB/T 4754-2017) and based on Question Q206 of the CMDS 2017 survey ("What is your current industry

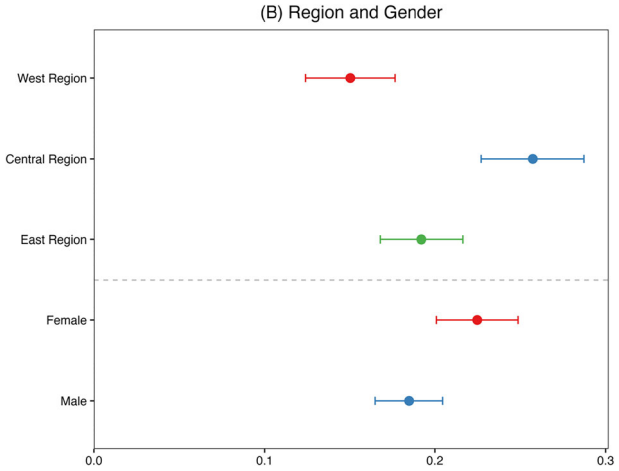

Fig. 11 Heterogeneous effects by region and gender

of employment?"), industries such as information transmission, software and IT services, finance, real estate, leasing and business services, as well as scientific research and technical services, are categorized as high-tech sectors. In contrast, agriculture, forestry, animal husbandry and fishery, mining, utilities (including electricity, coal, water, and heat supply), construction, and accommodation and catering fall under the category of low-tech industries.

Figure 10 reveals that while family-oriented migration significantly promotes entrepreneurship in both high-tech and low-tech industries, the effect is substantially stronger in the latter. This disparity likely stems from the differing entry barriers between the sectors. High-tech entrepreneurship demands advanced qualifications and significant resources, thus constraining the influence of family migration. Conversely, the lower capital and skill requirements of low-tech industries make them more accessible to migrant households. Consequently, the entrepreneurial effect of family migration is amplified as its degree increases, particularly within the low-tech sector.

Given the difficulty of directly observing the skill level of migrant workers, this study uses educational attainment as a proxy. Migrants with education levels at or above junior college are categorized as high-skilled, and those below this level are categorized as low-skilled. A similar pattern emerges for skill-level heterogeneity, also shown in Fig. 10. The positive effect of family migration on entrepreneurship is significantly more pronounced for low-skilled workers than for high-skilled counterparts. This is likely because highly educated or skilled migrants tend to access more stable and better-paying jobs, leading to higher opportunity costs and consequently lower incentives to pursue entrepreneurial ventures.

7.2 Region and Gender

This study further investigates the heterogeneous effects of family migration across gender and geographical regions. As shown in Fig. 11, the regression results reveal

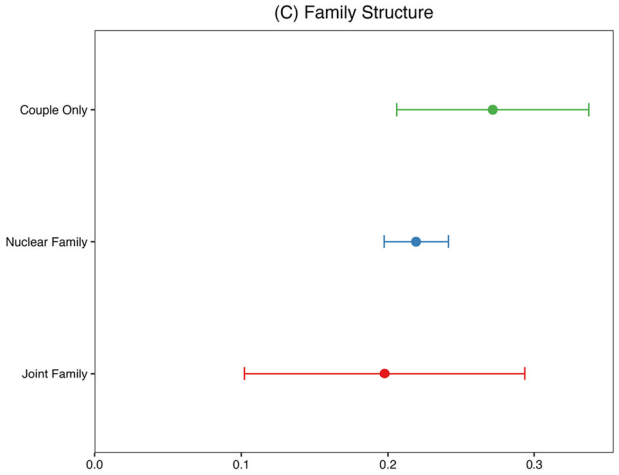

Fig. 12 Heterogeneous effects by family structure

significant group differences. By geographical region, family migration exerts a significant positive influence on entrepreneurship across all three regions. However, the magnitude of the effect exhibits a clear gradient: it is strongest in the Central region, followed by the Eastern region, and is relatively weakest in the Western region. This regional variation may be attributed to a trade-off between entrepreneurial opportunities and institutional or living costs. Although the Eastern region offers a more dynamic market environment, its high institutional barriers—such as restrictive Hukou policies and elevated living expenses—partially offset the positive impact of family migration. In contrast, the Western region's limited market size constrains the overall opportunity structure for entrepreneurial activities. The Central region appears to strike a more favorable balance, combining robust economic growth and expanding market capacity with relatively lower institutional constraints and living costs, thereby amplifying the pro-entrepreneurial effect of family migration.

Regarding gender, family migration has a significant positive effect on the entrepreneurial decisions of both males and females, though this promotional effect is notably stronger for women than for men (Lersch, 2016; Kil et al., 2018). This divergence underscores the distinctive nature of entrepreneurship as a flexible career path that affords women greater temporal autonomy than traditional employment, enabling them to integrate family responsibilities with economic participation and personal development.

7.3 Family Structure

Given the diversity of family structures within our sample, we conduct a heterogeneity analysis to explore whether the effect of family migration varies across different household types. A preliminary analysis revealed that certain structures, such as single-parent households, stem families formed around a single parent, or households with only extended kin, have insufficient sample sizes ($n < 100$) to yield

stable and valid estimates after applying the stringent dual fixed effects (destination city and origin county). Therefore, to ensure the robustness of our findings, our heterogeneity analysis focuses on three theoretically representative and analytically valuable family structures with adequate sample sizes: 1) Couple Only households (N = 7574), where only the spouse has co-migrated; 2) Nuclear Family households (N = 31,585), consisting of the respondent, spouse, and minor children; and 3) Joint Family households (N = 2990), which are nuclear families that also include co-residing parents. These three structures effectively represent key stages of the family life cycle, from simple to complex formations.

Figure 12 reveals two key findings. First, the positive effect of family migration on entrepreneurship is robust across all three major family structures. Second, significant differences exist in the magnitude of this effect. The pro-entrepreneurial impact is strongest in "Couple Only" households, followed by "Nuclear Family" households, and weakest in "Joint Family" households. This heterogeneity analysis corroborates our sensitivity analysis conclusions while revealing the interactive effects of both dimensions, further substantiating that even within close-knit family ties, the economic dependency of co-migrating members is a key moderating factor, which explains why more complex family structures—those including dependent children, elderly requiring care, and non-core relatives—tend to weaken the pro-entrepreneurship effect of family migration.

8 Conclusions

This study examines the impact of family-oriented migration on the entrepreneurial activities of rural migrants in China. Using data from the 2017 China Migrants Dynamic Survey (CMDS) and employing a rigorous identification strategy with fixed effects in destination-city and origin-county levels, our findings show that family-oriented migration significantly promotes entrepreneurship among rural migrants, a one-unit increase in the family migration index is associated with a 20.1% increase in the probability of entrepreneurship. This result remains robust across various validation checks, including propensity score matching, placebo tests, and models with stringent fixed effects, offering compelling evidence that family-oriented migration plays a pivotal role in shaping entrepreneurial outcomes. Sensitivity analyses along two dimensions—kinship proximity and economic functionality—further demonstrate that the co-migration of core family members and migration without heavy dependents are critical determinants of entrepreneurial engagement.

Mechanism analyses suggest that family-oriented migration fosters entrepreneurship primarily by enhancing social integration and income-generating motivation. However, peer effects negatively moderate this relationship and further weaken the positive influence of social integration and income motivation on entrepreneurship. Heterogeneity analysis indicates that this promotive effect is more pronounced among women, low-skilled migrants, those in low-tech industries, and necessity-driven entrepreneurship. Regionally, the effect is strongest in central China compared to eastern and western counterparts. In terms of household structure, the effect is strongest in "Couple Only" households, followed by "Nuclear Family" households, and weakest in "Joint Family" households. These findings underscore the

multifaceted role of family in providing risk control, resource pooling, and identity reconstruction in urban settings, thereby shaping entrepreneurial trajectories in the context of institutional constraints.

In light of the empirical results, several policy measures should be considered: In terms of social integration, communities serve as the "last mile" for policy implementation and represent a crucial arena for migrant populations to integrate into urban life, establish social capital, and develop a sense of belonging. At the community and neighborhood levels, governments should establish refined and humanized service management systems for migrant populations, comprehensively understanding migrant workers' basic conditions, development needs, and service demands through precise registration and dynamic statistics. More importantly, systematic promotion of migrant population integration should be achieved through diverse community activities and institutionalized participation channels, enabling them to gradually develop community identification and ownership consciousness through participation, ultimately fostering genuine community belonging and urban identity. Regarding housing security, the fundamental supportive role of residential stability for family-based entrepreneurship must be fully recognized. Policymakers should provide enhanced rental subsidies and targeted support for migrant families, ensuring priority access to affordable housing that meets residential and business requirements.

Regarding skill enhancement, migrant worker entrepreneurship often becomes trapped in intra-group "involution" and homogeneous competition due to insufficient human and social capital for upward mobility. Therefore, support policies must shift from simple entrepreneurship funding to fundamental capacity building for migrant workers. A diversified re-education system should be established with participation from public schools, private institutions, and non-governmental organizations. Training content must keep pace with market demands, expanding from basic vocational skills to modern commercial skills such as digital marketing, online operations, and financial knowledge, aiming to broaden entrepreneurs' employment channels and development opportunities, effectively avoid homogeneous competition, and enhance entrepreneurship success rates and sustainability.

Hukou reform should follow a phased approach, prioritizing breakthroughs in core public services such as education and healthcare. For migrant worker children's educational access, an enrollment mechanism should be established that relies primarily on residence permits while incorporating supplementary points-based criteria, thereby completely severing the linkage between compulsory education eligibility and parental hukou status. Concurrently, inter-regional education cost-sharing mechanisms must be institutionalized to prevent destination governments from bearing disproportionate fiscal burdens. Regarding healthcare security for migrant elderly, cross-regional medical insurance portability and continuity should be accelerated, with the establishment of specialized community-based medical service networks in destination areas. Furthermore, comprehensive family support service systems that operate independently of hukou restrictions should be developed, with governments implementing targeted care and welfare policies for both migrant elderly and minors. Specifically, through fiscal subsidies and government procurement of services, the development of universal childcare facilities and elderly daycare centers within communities should be promoted to provide accessible and

reliable social services for migrant families. These systematic reforms aim to eliminate institutional barriers that constrain family resources, thereby unleashing migrant workers' entrepreneurial potential and enabling more effective utilization of family-based migration's positive effects on business creation.

Finally, we acknowledge several limitations of our study. First, our analysis relies on 2017 cross-sectional data, which predates the COVID-19 pandemic. Regarding potential concerns about data timeliness, we note that macro-level data from China's National Bureau of Statistics confirms that the fundamental trend of rural-to-urban migration remains stable and robust in the post-pandemic era. From a theoretical perspective, recent economic uncertainties may even amplify the family's role as a crucial unit for risk-pooling and resource consolidation. Second, as CMDS constitutes cross-sectional data, we cannot employ time and household dual fixed effects that would be available with panel data, enabling more robust causal identification by simultaneously controlling for unobserved household heterogeneity and temporal variations. Third, the specific weight assignments involve certain assumptions about unobservable true weights. Although our sensitivity analyses demonstrate that core findings are robust to weight variations, this remains an area for further methodological refinement.

Data Availability The data that support the findings of this study are from the China Migrants Dynamic Survey (CMDS). The data are available at: https://www.ncmi.cn/phda/dataDetails.do?id=CSTR:17970.11.A000T.202306.185.V1.0-V1.0.

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Compliance with ethical standards

Conflict of Interest The author declares no competing interests.

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