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Far from home: migration, venture and income mobility

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ABSTRACT

This work focuses on the role that interregional migration within a country can play in fostering intragenerational income mobility through its effect on households' participation in business venture. Unique panel data on Chinese households from 2015 to 2019 identifies migration experience and provides detailed information on income and entrepreneurial activities. Our key finding is that migration increases upward economic mobility within cohorts by enhancing opportunities of entrepreneurship, and this pattern is more salient in regions with more severe inequality. Consequently, migrant population in these areas enjoy greater chances when climbing income ladders, which may further alleviate regional income inequality in the long run. The estimation results remain robust when winsorising income, using sub-samples of follow-up households in repeated surveys and altering the scale of income mobility. The analysis in this article, coupled with literature on migration and entrepreneurship, provides a new perspective on how free migration matters in improving intragenerational mobility and longer-term income distribution.

1. Introduction

In the process of industrialisation, migration of labour to cities has been the major engine of China's rapid growth. According to the latest national census, interregional migration has increased by 70% over the last decade. Given the restriction of household registration (*Hukou*) system, most contemporary internal flows of population were non-permanent and migrated for economic reasons such as training, venturing and job searching (Duan et al., 2015). A whole slew of literature has documented income differentials as salient impetus in households' migration decisions (Kennan & Walker, 2011; Topel, 1986; Zhang & Song, 2003), but it says little about how migration further affects households' income and long-term changes in its relative income after a decision to move has been made. Does the mobility of 'human' propel the mobility of 'income'? Can households ameliorate their financial status by moving to a

new place away from their hometowns? For policy makers, is it possible to mitigate social income stagnation and equalise income distribution by relaxing settlement requirements and encouraging interregional migration?

The incentive of migration, a life-changing decision for every family, is linked to pursuing higher expected present value of lifetime income (Kennan & Walker, 2011; Topel, 1986). In time-series analyses of Zhang and Song (2003), it is concluded that inter-provincial migrants were motivated by the rural-urban income disparities in China. Laskienė et al. (2020) also assert income inequality plays an extremely important role in international immigration and emigration based on the statistics of E.U. Member States. It means the process of migration has involved rational self-selection. Compared with non-migrant households, migrant households are generally poorer and more capital constrained (Taylor et al., 2003). However, the income effect of migration is worth much more attention. The majority of poorer migrants in host cities or areas have been excluded proportionate opportunities in housing, insurance, health care, offspring's education and access to credit (Bang et al., 2016; Chan, 2015; Richburg, 2010; Wang & Benjamin, 2019). When host households of higher-tier classes spontaneously enjoy greater income lift than move-in ones, the disparities of earnings and wealth may get much more serious, so that rigid social stratification will ultimately become a big issue.

Although the initial intention of most migrants is to narrow income gap with residents in destinations, it is still controversial whether going far from home stimulates upward income mobility and therefore alleviates economic inequality. A broad array of literature supports migration plays a role of equaliser in the distribution of welfares. Foltz et al. (2020) argue that a ramified genealogical network in rural China increases migration and further decreases income inequality within the original villages. Hackl (2018) explains how mobility equity, symbolised by the opportunities of migration, contributes to reduced economic inequalities. Exploiting income transition matrix and Gini coefficient, Sun et al. (2014) find the migration opportunity is an important path of upward mobility for the poor households, of which the income level can converge with the affluent. Zhu and Luo (2010), Giles (2006) and Taylor et al. (2003) emphasise the negative impact of rural-to-urban migration on rural poverty and income inequality. Nevertheless, conjecturing migrants disproportionately benefit the rich and therefore widen the inequality of income distribution, some studies lend no support to propositions above. Howell (2017) focuses on the migrants' remittances in China' s rural minority areas and has found migration increases income inequality among ethnic groups. Wang and Benjamin (2019) elucidate migration extends urban–rural income gap when considering capital income. Zhan et al. (2021) provide evidence that migration reduces income inequality in urban areas but increases income inequality in rural areas. From perspectives of different countries, relevant studies also put forth a causal relationship between migration and inequality increases (Barham & Boucher, 1998; Beyene, 2014; Du et al., 2005; McKenzie & Rapoport, 2007). There are also multiple heterogeneous findings revealed in the previous research. For example, Sa (1981) explains that population growth aroused by immigration concurrently leads to upward mobility and rising intracohort inequality. Arslan and Taylor (2012) find migration appears to increase non-farm income inequality but potentially contributes to pro-poor income growth.

Inspired by previous literature exploring the nexus between households' migration-related behaviours and income inequality, we postulate human mobility and income mobility are inseparably connected. Compared to cross-sectional inequality, income mobility is another mainstream gauge of the distribution of incomes, which has collected considerable attention since the pioneering work of Schumpeter (1955). This is not surprising given ascending income inequality across the population; but of equal importance is the mobility of households' incomes and longer-term economic well-being within the distribution. Income mobility and income inequality often appear to separate although they are inherently related (Fields & Ok, 1996; Khor & Pencavel, 2006; Shorrocks, 1978a). A growing body of literature has recognised that a static notion of households' current economic status cannot reveal the panoramic view of dynamics of income distribution in an economic system (Chakravarty, 1995; Creedy & Wilhelm, 2002; Kang & Rey, 2020; Maasoumi, 1998; Ruiz-Castillo, 2004). The mobility of incomes matters because the poorest may not be benefiting from economic growth even though poverty declines in the country (Afzal et al., 2019). Accompanied with traditional indices of income inequality at a particular point or period of time, measuring income mobility provides a richer picture of the income possibilities for households throughout their lifetime. For example, in a group consisting of two households with income flows in two years, the income distribution in the first year is (1, 0), and it turns to (0, 1) in the second year. The distribution of annual incomes is sharply unequal at each independent observation period, whereas the dynamic distribution is very even. Shorrocks (1978a) has described mobility as 'dynamic' measures of income variation, in comparison to 'static' measures of inequality. It has been recognised that the measurement of inequality is a simple snapshot of income spectrum, which is inadequate to visualise life-cycle equity of movement up and down the distribution (Atkinson et al., 1992). In line with this insight, Khor and Pencavel (2006) propose that if the exacerbation of inequality in annual incomes coexists with more income mobility from year to year, income inequality measured over a longer interval of time may not increase at all. Kang and Rey (2020) recently portray the income mobility as a complementary measure for income inequality measures, which evaluates changes in lifetime welfare. These viewpoints capture the prime importance of income mobility. Thus, identifying determinants of income mobility not only affects how we interpret chronically unbalanced distribution of incomes, but also helps economists to discern practice and policy implications for reducing poverty and equalising economic opportunities in a society.

Higher mobility is considered to be a central feature of the societies with lower level of rigid social stratification, inequality of opportunity and impermeable class boundaries (Jarvis & Song, 2017). After the seminal research of Shorrocks (1976, 1978a, 1978b), income mobility has been an intriguing topic of study for many economists. Most have focused on the meaning and measurement of income mobility (Fields, 2010; Fields & Ok, 1996; Khor & Pencavel, 2006; Schiller, 1977; Shi et al., 2010b), and few have empirically tested the determinants of income mobility, involving individual and household characteristics such as age, gender, education, race, income, employment, family members and social capital (Kalleberg & Mouw, 2018; Shi et al., 2010a). Both intragenerational and intergenerational mobility engender

concerns about dynamic changes of income distribution and social parity of opportunities. Intergenerational mobility measures relative mobility between successive generations (Alesina et al., 2018; Becker et al., 2018; Solon, 1992, 2002), and can be extended to multigenerational mobility reflecting socioeconomic status across three or more generations (Solon, 2018). Based on father–son pairs, a recent work in this field related to our article shows that immigrants have higher level of upward intergenerational mobility (Abramitzky et al., 2019). However, we focus on another dimension of economic mobility within an individual's or a cohort's lifespan, commonly known as intragenerational mobility. In general, it involves upward or downward movement over the course of income generation and wealth accumulation during the household's prime working years.

The presence of studies links various economic factors to movement up and down the income quintiles, but there is a paucity of literature discussing how intragenerational mobility is affected by household' decisions about "physical movement". Using a biennial micro dataset from the China Household Finance Survey (C.H.F.S.) during 2015 and 2019, this article goes a step further to examine the impact of interregional migration on intragenerational income mobility and then analyse a plausible mechanism behind this linkage. In this article, we investigate this mobility effect of interregional migration, mapping the relationship between human mobility and income mobility. Our main findings indicate that migration is positively and causally related to income mobility at household levels, which means households with experiences of migration have higher level of upward mobility within cohorts, and moreover, increasing migrant population across regions shows the potential of lessening regional income inequality. Venturing into business plays a desirable role when the households decide to move to improve their relative incomes.

The contribution of our article is threefold. Firstly, this article sheds new light on the impact of migration on the distribution of incomes by introducing the notion of income mobility. Existing literature tends to treat income inequality as a proxy of income distribution to clarify the countervailing effects of migration (Foltz et al., 2020; Giles, 2006; Hackl, 2018; Howell, 2017; Sun et al., 2014; Taylor et al., 2003; Wang & Benjamin, 2019; Zhan et al., 2021; Zhu & Luo, 2010). Given that income mobility is a more 'dynamic' measure relative to 'static' inequality, we utilise different indicators of both income mobility and income inequality and examine the correlation between migration and income distribution at household levels instead of at merely district levels. Secondly, we enrich the previous evidence by probing into the mechanism behind the effect that migration can mitigate income inequality and conduce to upward mobility. The mechanism has been neglected in the latest related work (Foltz et al., 2020). We find that migration may increase income mobility by promoting households' entrepreneurial activities, based on the proclamations that the experience of entrepreneurship invigorates greater upward mobility (Banerjee & Newman, 1993; Jianakoplos & Menchik, 1997; Lebergott, 1976; Quadrini, 1999, 2000). Thirdly, migration in this article is not limited to specific inter-provincial, intra-provincial or urban–rural migration, since the scope of migration has been broadened in the era of post industrialisation. Many studies centre on the effect of urban–rural migration (Foltz et al., 2020; Wang & Benjamin, 2019; Zhu & Luo, 2010), but the

emergence of new trends (e.g., new job opportunities, rural reconstruction) has been obscuring the direction and pattern of migration. Migration behaviours have been widely diversified in the high-speed society. We define migrant households as those who reside in places other than their hometowns for more than half a year. Therefore, the research may provide more generalised welfare implications for adjusting population policy.

2. Data and variables

2.1. Data

We use microdata from C.H.F.S., biennially launched by the Survey and Research Center for China Household Finance since 2011. The survey has collected detailed information encompassing household income, wealth, assets, liabilities, personal and family decisions, demographics, and many other categories of first-hand raw data. Respondents are nationally representative from 29 provinces across China. The sample bias is minimised because of the nationwide random selection process. Available five waves of the survey (2011, 2013, 2015, 2017, 2019) have so far attracted massive attention from the government, academia, and media around the world (Korkmaz et al., 2021; Ye & Yue, 2023; Yue et al., 2020, 2022a, 2022b; Zhang, 2016; Zhou et al., 2023).

Although the survey began before 2015, some questions are absent in the earlier waves compared with the subsequent waves. Our independent variable of interest would be derived from the questions of households' decisions about migrating. Because the migration-related questions are not contained until the third wave, this article only exploits household-level data from the last three waves from 2015 to 2019. Previous studies based on C.H.F.S. also selectively utilise certain one wave or waves according to the availability of required measures (Korkmaz et al., 2021; Wang et al., 2021). Furthermore, it is indispensable to rule out non-response observations and outliers from our samples. Consistent with Bredtmann et al. (2018), Korkmaz et al. (2021), Yue et al. (2023) and Yue et al. (2022b), we treat the age of 16 as lower limit to exclude samples without independent ability in decision- and money-making. After dropping household samples with missing values and whose householders are younger than 16, the final database covers 21,631 households in 2015, 26,799 households in 2017 and 17,424 households in 2019. The total sample includes 65,854 observations. In general, processed samples are diversified in economic, geographic, and financial status.

2.2. Variable

For the dependent variable, there are a variety of indicators measuring intragenerational mobility. Transition matrix P is usually used to interpret mobility index $M(P)$ since Shorrocks (1976, 1978a, 1978b), namely Shorrocks' Index. The index provides a convenient and concise way to reveal the dynamic nature of income distributions by computing transition probabilities. It has been widely applied and extended in the ensuing studies. The country-specific level of Shorrocks mobility has been assessed using data of different economies such as Spain (Cantó Sanchez, 2000), Europe (Gregg & Vittori, 2008), China and the U.S. (Khor & Pencavel, 2006). Allanson

(2019) makes novel use of a decomposition of Shorrocks' index by the source of incomes. Kang and Rey (2020) conduct Monte Carlo experiments to approach two issues remaining in the statistical inference of the Shorrocks mobility estimator. However, Fields and Ok (1996) argue such mobility measures are based on the classical Markov assumption of constancy of the transition matrix, which has been rejected by several empirical studies since the assumed Markovian distribution is non-stationary through time. Other prevailing indicators include the correlation coefficient (McCall, 1973), Hart's index (Hart, 1976), cohort ventile position (Schiller, 1977), rank correlation (Gottschald, 1982; Lillard & Willis, 1976), Beenstock's Gini mobility index (Shi et al., 2010b), and positional movement (Fields, 2000; Jantti & Jenkins, 2013; Jarvis & Jenkins, 1996; Jianakoplos & Menchik, 1997).

In this article, following Jarvis and Jenkins (1996) and Fields (2000), we adopt household's positional changes in income centiles as the measurement of mobility. The main reason that positional analysis gets so popular and important in income mobility studies is that movement among positions is the way most analysts have become accustomed to thinking about mobility (Jarvis & Jenkins, 1996). Analysing positional mobility matrices provides a comprehensible and convenient method to evaluate income changes individual by individual, or household by household (Fields, 2000). Similar to income mobility, wealth mobility is defined as dynamics in the relative position of households ranked according to wealth (Jianakoplos & Menchik, 1997). Although household' quintiles or deciles in the income distribution is most commonly used for measuring economic position, there is a plethora of research employing ventiles, centiles, or higher quantiles consisting of more subdividable ranks. Due to tractability, we first present the income transition matrix established on shares of sample households in each income quintile (see Table 1), to illustrate the summarised information of income distribution. Then, we measure positional movement in income centiles as intrageneration mobility in empirical models. Income mobility in millesimals is also introduced to be an alternative proxy of the dependent variable in robustness tests.

Independent variable of interest is related to households' behaviours of migration. In accordance with National Bureau of Statistics,[1] the floating population officially refers to the population whose actual residence is inconsistent with registered residence, namely, the population who has left the place of household registration for at least six months. Complying with the definition, the measurement of migrant household has become a growing consensus in academia. In Liang et al. (2014), the migrant population is defined as households residing in a location that is different from their domiciles of origin for at least six months. Sun et al. (2014) construct the dummy variable of migration based on whether a household had migrant workers. Following Liang et al. (2014) and Sun et al. (2014), we measure *Migration* as a dummy variable equal to 1 if family members (older than 16) of the household have lived or worked in places other than registered residence for more than half a year.[2]

With reference to existing literature, it is essential to curb economic factors concerning both individual characteristics of household heads and basic household demographics. Thus, the independent variables that we controlled include age (Shi et al., 2010a), age square divided by 100, gender (Woolard & Klasen, 2005), years of

Table 1. Summary statistics.

Variables	Observations	Mean	SD	Min	Max
Mobility	65,854	1.123	27.573	−99	99
Migration	65,854	0.236	0.425	0	1
Age	65,854	55.950	13.529	18	102
Male	65,854	0.786	0.410	0	1
Schooling	65,854	8.969	4.158	0	22
Maritalstatus	65,854	0.863	0.344	0	1
Employment	65,854	0.639	0.480	0	1
Health	65,854	0.418	0.493	0	1
Familysize	65,854	3.414	1.654	1	19
Workforceratio	65,854	0.567	0.364	0	1
Rural	65,854	0.383	0.486	0	1
Baseyearnetassets	65,854	923,204.600	3,378,909	−7,577,446	734,000,000

This table reports summary statistics. All variables are based on the micro data set from the latest three waves of China Household Finance Survey (CHFS), covering 21,631 households in 2015, 26,799 households in 2017 and 17,424 households in 2019.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

Table 2. Income transition matrix.

		Samples						Percentage				
		1	2	3	4	5	Total	1	2	3	4	5
		Income Quintiles in 2019: All households										
Income Quintiles in 2015	1	1,274	734	381	258	151	2798	0.46	0.26	0.14	0.09	0.05
	2	771	911	492	288	175	2637	0.29	0.35	0.19	0.11	0.07
	3	481	621	710	402	258	2472	0.19	0.25	0.29	0.16	0.10
	4	286	370	582	769	376	2383	0.12	0.16	0.24	0.32	0.16
	5	201	244	342	634	885	2306	0.09	0.11	0.15	0.27	0.38
		Income Quintiles in 2019: Migrant households										
	1	97	116	87	46	50	396	0.24	0.29	0.22	0.12	0.13
	2	88	126	91	62	35	402	0.22	0.31	0.23	0.15	0.09
	3	77	100	110	73	53	413	0.19	0.24	0.27	0.18	0.13
	4	50	67	98	112	65	392	0.13	0.17	0.25	0.29	0.17
	5	26	41	59	108	128	362	0.07	0.11	0.16	0.30	0.35
		Income Quintiles in 2019: Non-migrant households										
	1	1,177	618	294	212	101	2,402	0.49	0.26	0.12	0.09	0.04
	2	683	785	401	226	140	2,235	0.31	0.35	0.18	0.10	0.06
	3	402	521	600	329	205	2,057	0.20	0.25	0.29	0.16	0.10
	4	236	303	484	657	311	1,991	0.12	0.15	0.24	0.33	0.16
	5	174	203	283	526	757	1,943	0.09	0.10	0.15	0.27	0.39

This table reports the income transition matrix based on shares of sample households in each income quintile. The elements along the left diagonal detail the proportion of households not experiencing positional movements from 2015 to 2019. The element above (below) the left diagonal details the proportion of households going through upward (downward) income mobility.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

schooling (Sun et al., 2014)), marital status (Khor & Pencavel, 2006), employment (Sun et al., 2014), health (Sun et al., 2014), family size (Woolard & Klasen, 2005), workforce ratio (Sun et al., 2014), rural or urban areas (Lin et al., 2004), and base-year net assets (Woolard & Klasen, 2005). Gender is a dummy variable equal to 1 if it is a male-headed household. Marital status, employment and health take the value of 1 when the head of household is married, employed and in good health. We also define a dummy variable *Rural* equal to 1 if the respondent household resides in rural region and 0 otherwise.

Table 2 presents summary statistics. For each variable, columns (2) to (6) report the number of observations, mean, standard deviation, minimum, and maximum

values. Income mobility shows households averagely experience 1.123 upward movement within income centiles. Among all samples, 23.6% households have members who once migrated to non-registered places. The difference of income mobility between migrant and non-migrant households is also demonstrated to be specific. Survey in 2019 manifests one quarter of population has migrated away from hometown. They improve economic positions by 3.08, compared with non-migrant households who are elevated by 1.77 within income distribution. In 2017, there are 30.18% households experiencing migration, of which the average income mobility is 3.233 from 2015 to 2017, and their income ranking is 56.431 on average. On the contrary, 69.82% households have no experience of migration, whose mean value of position distributed in income centiles is 45.584. And they have averagely endured 1.3747 downward positional movement during the interval of periods. Similar description is obtained in 2015. Households with migration experience account for 14.4% of the total sample. The average income mobility from 2013 to 2015 and ranking in 2015 are 4.122 and 53.311, respectively. The corresponding figures show 0.384 and 49.474 in the counterpart households without migration. The difference between the two groups is significant, inferred from the standard deviation and t-statistics of the mean comparison.

Table 1 presents income transition matrix. Most of the previous studies analysing income mobility based on the transition matrix where the rows and columns are divided into quintiles (Khor & Pencavel, 2006; Shi et al., 2010a, 2010b; Sun et al., 2014; Woolard & Klasen, 2005). The matrix shows samples chunked into five groups by sorting households from the highest-income quintile to the lowest-income quintile. The value of elements on the left diagonal reflects the proportion of households immobile in each quintile during the observation period, and the value of the element above the left diagonal represents the proportion of households that go through upward income mobility. Compared with the sample of all households and non-migrant households, income mobility occurs in a larger share of migrant households, for which the percentage of income immobility is also lower. There are 12,596 households followed up by the survey from 2015 to 2019. We further calculate Shorrocks' index based on income transition matrix. For all samples in 2015, the index is 0.8, and the ratio of upward mobility to downward mobility is 0.711. For migrant and non-migrant households, Shorrocks' indices are 0.885 and 0.788, and upward/downward mobility ratios are 0.919 and 0.676, respectively. It indicates that both the level and quality of income mobility are higher for households who have ever migrated. Hence, we assume, a priori, that migration improves households' income mobility, especially upward mobility.

3. Model

Following Foltz et al. (2020), we analyse the link between migration and income mobility with the mediating mechanism of entrepreneurial choices in between. The first baseline model employed is an O.L.S. regression model. Both reverse causality and omitted variables may lead to the issue of endogeneity. Reverse causality is derived from adverse selection effect of households. As mentioned above, it is more

likely for households with lower initial income to decide to migrate to pursue better economic status (Kennan & Walker, 2011; Topel, 1986). Some research also suggests the level of households' income sets thresholds for migration. For example, Stark and Taylor (1989) find that only households whose absolute income exceeds a certain value have more opportunities to move, since migrant workers require minimum initial capital to cover the cost of migration. Another source of endogeneity is omitted variables. Some unobserved variables such as environmental factors and individual traits that do not vary over time may simultaneously affect the households' income mobility and migration decision. Therefore, this article exploits a two-way fixed-effects (F.E.) model to minimise omitted variable bias. To address endogeneity issue, we further carry out a two-stage least squares (2.S.L.S.) estimation, using the instrumental variable (I.V.) that affects the migration behaviours but not affects the household's income mobility directly. It has been documented that factors such as the urban–rural income gap, distance, and the number of urban populations have effect on the inter- and intra-provincial migration (Zhang & Song, 2003). As a critical element usually established within geographical proximity, the lineage network plays a role in reducing migration cost and therefore facilitating the propensities of migration (Foltz et al., 2020). At the same time, the number of migrants within a district is relatively small compared with the total population of the district so that it has no direct association with the rank of household income. The relevance and exogeneity of the I.V. can be ensured in this way. Thus, we employ the number of migrant households in the district where the sample is located as an I.V. It is an exogenous variable that may affect the household's decision about whether to migrate.

The general expression of baseline models is shown as follows. $Mobility_{it-1,t}$ reflects the positional change within the income centiles for household i from period $t-1$ to period t. The greater the absolute value of $Mobility_{it-1,t}$, the greater the income mobility of the household during the observation period. $Migration_{it}$ is a dummy variable that determines whether any family member has experience of migration. X_{it} includes a variety of control variables. mu_j is the year F.E. $lambda_k$ is the province F.E. $varepsilon_{it}$ is an unobserved error term.

$$Mobility_{it-1,t} = \beta_0 + \beta_1 Migration_{it} + \beta_2 X_{it} + \mu_j + \lambda_k + \varepsilon_{it} \quad (1)$$

Using following models, we further explore whether migration helps households achieve top income centiles, whether migration can alleviate regional income inequality, and how the number of migrant members affects income mobility. In Equation (2), $HincomeK_{it-1,t}$ is equal to 1 if the household enters the top 40% (20%) centiles in period t from other income tiers in period $t-1$ when $K = 1$ ($K = 2$), otherwise it is 0. The model shown in Equation (3) is used to examine the impact of migration on mobility in regions with different level of income inequality. The numeric variable $Ginicounty_{it}$ represents the Gini coefficient of the county where household i resides in year t. As a prominent measure of income inequality, the Gini coefficient varies between 0 and 1, indicating income distribution changes from of perfect equality to of perfect inequality. The interaction between migration and Gini

coefficient is introduced in this model. Given the number of migrant members differs among heterogeneous households, we then exploit the number of family members who have moved away as the proxy of migration in Equation (4). $Migrationnumber_{it}$ is a continuous variable to calliper how many members involve themselves in migration.

$$HincomeK_{it-1,t} = \beta_0 + \beta_1 Migration_{it} + \beta_2 X_{it} + \mu_j + \lambda_k + \varepsilon_{it} \qquad (2)$$

$$Mobility_{it-1,t} = \beta_0 + \beta_1 Migration_{it} + \beta_2 Migration_{it} \times Ginicounty_{it} \\ + \beta_3 Ginicounty_{it} + X_{it}\gamma + \mu_j + \lambda_k + \varepsilon_{it} \qquad (3)$$

$$Mobility_{it-1,t} = \beta_0 + \beta_1 Migrationnumber_{it} + \beta_2 X_{it} + \mu_j + \lambda_k + \varepsilon_{it} \qquad (4)$$

One of major contributions of our research is to explain the mechanism behind how income mobility is affected by migration. Inspired by Quadrini (1999), Quadrini (2000) and Mahé (2022), the plausible mechanism will be examined by the following model. Using Equation (5), this article investigates the impact of migration on entrepreneurial activities. We define $Business_{it}$ as a dummy variable equal to 1 when the household is engaged in business, covering diversified projects of production and operation, and 0 otherwise. The measurement corresponds to Quadrini (1999) who defined 'entrepreneurs' as families owning their own business. The pioneering study of Quadrini (1999) has documented that entrepreneurship can increase the wealth–income ratio, which helps households obtain higher incomes at given asset holdings and therefore enjoy upward wealth mobility. Quadrini (2000) further develops a dynamic general equilibrium model to figure out whether entrepreneurs experience higher upward mobility. Given that the impact of entrepreneurship on mobility of earnings exists, the other strand of studies focuses on exploring the relationship between the households' choices of venturing and migration. For example, Mahé (2022) provides evidence that migrants are more likely to choose self-employment and start up a firm when going back their home countries because they have accumulated work experience and initial capital during emigration. On the basis, we presume that migration behaviour can increase the level of income mobility by boosting households' entrepreneurial participation.

$$Business_{it-1,t} = \beta_0 + \beta_1 Migration_{it} + \beta_2 X_{it} + \mu_j + \lambda_k + \varepsilon_{it} \qquad (5)$$

4. Results

4.1. Baseline results

Table 3 presents the baseline results using Equation (1). Columns (1), (2), (3) and (4) report the O.L.S., the 2.S.L.S., the F.E. model and the F.E. 2.S.L.S. results analysing the relationship between the behaviour of migration and intragenerational income mobility. Estimation in each column is based on the non-migrant households as the

Table 3. Baseline results.

	(1) OLS	(2) 2SLS	(3) FE	(4) FE 2SLS
Migration	3.761***	10.876***	5.294***	24.264***
	(0.269)	(1.691)	(0.528)	(3.444)
Age	−0.221***	−0.169***	0.023	0.166
	(0.058)	(0.060)	(0.184)	(0.186)
$Age^2/100$	0.221***	0.176***	−0.003	−0.131
	(0.052)	(0.053)	(0.164)	(0.166)
Familysize	1.038***	0.744***	3.191***	2.401***
	(0.083)	(0.108)	(0.228)	(0.267)
Male	−0.829***	−0.899***	−0.837	−1.102
	(0.279)	(0.279)	(0.676)	(0.677)
Schooling	0.082***	0.024	−0.010	−0.171
	(0.030)	(0.033)	(0.103)	(0.107)
Workforceratio	1.286***	0.786**	0.164	−1.279
	(0.382)	(0.400)	(1.142)	(1.169)
Maritalstatus	0.450	0.466	1.767*	1.923**
	(0.336)	(0.336)	(0.942)	(0.944)
Employment	3.419***	3.461***	7.090***	7.230***
	(0.284)	(0.284)	(0.602)	(0.603)
Health	1.051***	1.120***	1.495***	1.661***
	(0.229)	(0.230)	(0.469)	(0.470)
Rural	−3.123***	−3.195***	−0.282	−0.527
	(0.266)	(0.267)	(2.394)	(2.388)
$ln(Baseyearnetassets)$	−0.338***	−0.354***	−0.466***	−0.512***
	(0.031)	(0.031)	(0.060)	(0.061)
Household Fixed Effect			Yes	Yes
Province Fixed Effect	Yes	Yes		
Year Fixed Effect	Yes	Yes	Yes	Yes
Obs	65,854	65,854	65,854	65,854
Adj.R-sq	0.019	0.017	0.028	0.026
F value at First-stage		27.61		27.61
Cragg-Donald Wald F		1,547.261		1,547.261
Kleibergen-Paap rk LM statistic		1,238.580		1,238.580

This table reports the baseline results from testing the impact of migration on intragenerational income mobility. The dependent variable *Mobility* (positional changes in income centiles) is regressed on *Migration* (having the experience of migration) and other household characteristics. Heteroskedasticity robust standard errors are given in parentheses. *** indicates significance at 1% level, ** at 5% level, and * at 10% level.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

reference group. Variables related to household demographics and characteristics of the household head are controlled.

In all columns, results show that migration has a significant positive impact on income mobility. The 2.S.L.S. coefficients is 10.876, which is significant at the 1% level. It indicates that compared with the households that have not migrated, households who have the experience of migration, on average, improve their rankings by nearly 11 in the income centile. The F.E. 2.S.L.S. estimate is more pronounced in magnitude. The coefficient is 24.264 and significantly different from zero. It can be graphically depicted that migration helps households go up by 24 'floors' in the 'building' of income distribution. The I.V. used in 2.S.L.S. estimation is highly significant in the first stage. Furthermore, the C.D. Wald F statistics and K.P. rk L.M. statistic are large enough to eliminate the problem of weak instrument. The coefficients of control variables generally meet our expectation. All baseline results in Table 3 consistently suggest that households' behaviour of migration significantly promotes their upward income mobility. This is similar to the results in Foltz et al. (2020), which find the poor gain more leeway to migrate and consequently increase their incomes.

4.2. Migration and households entering top income centiles

The results above confirm the positive effect of migration on the level of income mobility. The article further examines how migration affects the quality of mobility using Equation (2).

There is still discrepancy in the quality of mobility, even if the level of income mobility is identical. It can be regarded as high-quality mobility when households make the leap from lower income groups to the highest rankings of income distribution. Hence, we explore if it is possible for poorer households to reach top 20% or 40% income centiles after migration; that is, how migration affects the possibilities that households enter top tiers of incomes. Table 4 reports the estimation results. Columns (1) to (4) present the relationship between migration and households entering top 20% income centiles, using the approaches of O.L.S., the 2.S.L.S., the F.E. model and the F.E. 2.S.L.S. in sequence. The results for whether migration helps households enter top 40% centiles are demonstrated in columns (5) to (8). The 2.S.L.S. F.E. coefficients in columns (4) and (8) show that adopting the behaviour of migration makes the probability of achieving top 20% and 40% centiles increase by 6.1% and 15.7%, respectively. It implies that migration significantly increase the opportunities for poorer households to become one of the richest cohorts.

4.3. The effect of migration and regional income inequality

In Foltz et al. (2020), it is concluded that migration helps the poor accumulate greater wealth and then reduces regional income inequality. Hence, we expect to see the migration effect for households from different regions with diversified level of income inequality.

Based on Equation (3), we concern the estimates of the interaction term between migration and Gini coefficients of certain counties. Table 5 reports the results of this model. The estimated interaction coefficients in all columns are shown significantly positive. It conveys migration takes a larger part in promoting income mobility in areas with more severe inequality. According to the F.E. 2.S.L.S. result, choosing to migrate leads to 42.19-centile upward mobility in the most unequal counties where Gini coefficient equal to 1, and 2.28-centile upward mobility in the most equal counties where Gini coefficient equal to 0. The gap of mobility is nearly 40 centiles in regions with absolute equality and inequality. During the observation periods from 2015 to 2019, there are 911 counties whose mean value of Gini coefficient is 0.52. At the average level of regional inequality, the effect of migration is 23.03, indicating additional 23 floors migrant households are elevated in the building of distribution relative to non-migrants. Since income mobility can play a role in reducing income inequality in the long run (Atkinson et al., 1992), greater mobility stirred by migration in seriously unequal counties may be related to attenuated inequality in the regional dimension. The results render support to Foltz et al. (2020), Hackl (2018), Sun et al. (2014), Zhu and Luo (2010), Giles (2006) and Taylor et al. (2003) who document migration is conducive to alleviating income inequality.

Table 4. Migration and households entering top income centiles.

	OLS Top 20%	2SLS Top 20%	FE Top 20%	FE 2SLS Top 20%	OLS Top 40%	2SLS Top 40%	FE Top 40%	FE 2SLS Top 40%
Migration	0.030***	0.030	0.028***	0.061*	0.037***	0.077***	0.041***	0.157***
	(0.003)	(0.020)	(0.005)	(0.036)	(0.004)	(0.022)	(0.006)	(0.040)
Age	−0.002***	−0.002***	0.002	0.002	−0.001	−0.001	0.004*	0.004**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
$Age^2/100$	0.003***	0.003***	−0.002	−0.002	0.001	0.001	−0.003*	−0.004**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
Familysize	0.021***	0.021***	0.028***	0.027***	0.022***	0.020***	0.030***	0.025***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.003)
Male	−0.010***	−0.010***	−0.005	−0.006	−0.008**	−0.009**	−0.012	−0.014*
	(0.003)	(0.003)	(0.007)	(0.007)	(0.004)	(0.004)	(0.008)	(0.008)
Schooling	0.006***	0.006***	0.001	0.001	0.001***	0.001**	0.000	−0.001
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
Workforceratio	0.038***	0.038***	0.011	0.008	0.055***	0.052***	0.054***	0.045***
	(0.004)	(0.004)	(0.010)	(0.010)	(0.005)	(0.005)	(0.012)	(0.013)
Maritalstatus	0.009***	0.009***	0.013	0.014	0.008**	0.008**	0.011	0.012
	(0.003)	(0.003)	(0.008)	(0.008)	(0.004)	(0.004)	(0.010)	(0.010)
Employment	0.016***	0.016***	0.024***	0.025***	0.013***	0.014***	0.031***	0.032***
	(0.003)	(0.003)	(0.005)	(0.005)	(0.003)	(0.003)	(0.006)	(0.006)
Health	0.028***	0.028***	0.018***	0.018***	0.017***	0.017***	0.009*	0.010*
	(0.002)	(0.003)	(0.004)	(0.005)	(0.003)	(0.003)	(0.005)	(0.005)
Rural	−0.038***	−0.038***	0.021	0.020	−0.038***	−0.039***	−0.004	−0.005
	(0.003)	(0.003)	(0.020)	(0.020)	(0.003)	(0.003)	(0.026)	(0.026)
$ln(Baseyearnetassets)$	0.002***	0.002***	−0.002***	−0.002***	−0.000	−0.000	−0.002***	−0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Household Fixed Effect			Yes	Yes			Yes	Yes
Province Fixed Effect	Yes	Yes			Yes	Yes		
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	65,854	65,854	65,854	65,854	65,854	65,854	65,854	65,854
Adj.R-sq	0.046	0.046	0.015	0.014	0.028	0.025	0.015	0.014
F value at First-stage		53.56		53.56		79.20		79.20
Cragg-Donald Wald F		1,547.261		1,547.261		1,547.261		1,547.261
Kleibergen-Paap rk LM statistic		1,238.580		1,238.580		1,238.580		1,238.580

This table reports the associations between the experience of migration and a greater probability for households entering top 20% or 40% income centiles. In columns (1) to (4), the independent variable is a dummy variable indicating whether the household enters the top 20% centiles (the first quintile of income). In columns (5) to (8), the independent variable is a dummy variable indicating whether the household enters the top 40% centiles (the first two quintiles of income). Heteroskedasticity robust standard errors are given in parentheses. *** indicates significance at 1% level, ** at 5% level, and * at 10% level.

Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

Table 5. Migration and households in regions of income inequality.

	(1) OLS	(2) 2SLS	(3) FE	(4) FE 2SLS
Migration ∗ Ginicounty	11.023***	23.693**	16.958***	39.908**
	(3.220)	(9.730)	(5.755)	(17.718)
Migration	−1.920	−1.455	−3.617	2.281
	(1.679)	(5.232)	(3.016)	(9.361)
Ginicounty	−10.290***	−12.662***	−20.460***	−24.031***
	(1.686)	(2.666)	(3.287)	(4.994)
Age	−0.243***	−0.193***	0.021	0.152
	(0.058)	(0.059)	(0.181)	(0.183)
Age/100	0.217***	0.174***	−0.019	−0.136
	(0.051)	(0.052)	(0.162)	(0.164)
Familysize	1.040***	0.742***	3.153***	2.403***
	(0.082)	(0.107)	(0.229)	(0.266)
Male	−0.683**	−0.765***	−0.654	−0.911
	(0.274)	(0.275)	(0.656)	(0.658)
Schooling	0.060**	0.001	−0.004	−0.159
	(0.030)	(0.033)	(0.102)	(0.106)
Workforceratio	1.433***	0.972**	0.064	−1.233
	(0.378)	(0.396)	(1.137)	(1.161)
Maritalstatus	0.582*	0.609*	2.062**	2.202**
	(0.333)	(0.334)	(0.928)	(0.930)
Employment	2.926***	2.969***	6.464***	6.594***
	(0.282)	(0.283)	(0.599)	(0.600)
Health	1.088***	1.159***	1.476***	1.622***
	(0.226)	(0.227)	(0.460)	(0.462)
Rural	−2.673***	−2.756***	−0.538	−0.771
	(0.266)	(0.267)	(2.362)	(2.350)
ln(Baseyearnetassets)	−0.328***	−0.345***	−0.427***	−0.473***
	(0.031)	(0.031)	(0.059)	(0.060)
Household Fixed Effect			Yes	Yes
Province Fixed Effect	Yes	Yes		
Year Fixed Effect	Yes	Yes	Yes	Yes
Obs	64,285	64,285	64,285	64,285
Adj.R-sq	0.022	0.019	0.032	0.029
F value at First-stage		69.99		69.99
Cragg-Donald Wald F		1988.389		1988.389
Kleibergen-Paap rk LM statistic		2084.419		2084.419

This table reports the associations between the experience of migration and the increasing income mobility in areas with more severe income inequality. The interaction term between migration and Gini coefficient of the county where the household resides (*Migration ∗ Ginicounty*) is introduced and tested. Heteroskedasticity robust standard errors are given in parentheses. *** indicates significance at 1% level, ** at 5% level, and * at 10% level.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

4.4. Migrant family members and income mobility

Not all family members will participate in relocation activities. It is one of main concerns that how economic mobility is connected to the number of migrant members in a household.

We substitute the dummy variable of migration with the number of migrant members as the independent variable of interest. The impact of migrant family members on income mobility is discussed based on Equation (4). In Table 6, the O.L.S. and 2.S.L.S. estimation results using pooled cross-sectional data are shown in column (1) and (2), the F.E. and F.E. 2.S.L.S. estimation results using panel data are shown in columns (3) and (4). The coefficients of *migrationnum$_{it}$* in all columns indicate that the number of migrant members has a significant positive impact on the mobility of household income. According to the F.E. 2.S.L.S. estimate, an additional family member migrating to other places from the residence of origin would lead to households'

Table 6. Migrant family members and income mobility.

	(1) OLS	(2) 2SLS	(3) FE	(4) FE 2SLS
Migrantionnumber	2.621***	6.371***	4.076***	14.214***
	(0.180)	(0.991)	(0.360)	(2.017)
Age	−0.221***	−0.181***	0.017	0.140
	(0.058)	(0.059)	(0.184)	(0.185)
Age^2/100	0.220***	0.184***	0.004	−0.113
	(0.052)	(0.053)	(0.164)	(0.165)
Familysize	0.982***	0.678***	3.087***	2.253***
	(0.083)	(0.114)	(0.228)	(0.278)
Male	−0.838***	−0.904***	−0.825	−1.113
	(0.279)	(0.279)	(0.676)	(0.677)
Schooling	0.082***	0.036	−0.021	−0.144
	(0.030)	(0.033)	(0.104)	(0.106)
Workforceratio	1.284***	0.905**	0.207	−1.015
	(0.381)	(0.395)	(1.141)	(1.162)
Maritalstatus	0.443	0.446	1.768*	1.879**
	(0.336)	(0.336)	(0.941)	(0.943)
Employment	3.425***	3.466***	7.071***	7.240***
	(0.284)	(0.284)	(0.602)	(0.603)
Health	1.051***	1.102***	1.524***	1.621***
	(0.229)	(0.230)	(0.468)	(0.470)
Rural	−3.128***	−3.190***	−0.161	−0.516
	(0.266)	(0.267)	(2.396)	(2.388)
ln(Base − yearnetassets)	−0.338***	−0.352***	−0.468***	−0.507***
	(0.031)	(0.031)	(0.060)	(0.061)
Household Fixed Effect			Yes	Yes
Province Fixed Effect	Yes	Yes		
Year Fixed Effect	Yes	Yes	Yes	Yes
Obs	65,854	65,854	65,854	65,854
Adj.R-sq	0.020	0.017	0.030	0.026
F value at First-stage		27.76		27.76
Cragg-Donald Wald F		1848.450		1848.450
Kleibergen-Paap rk LM statistic		1264.305		1264.305

This table reports the associations between a greater number of migrant family members and a higher level of income mobility. The independent variable (*Migrantionnumber*) is measured as the number of family members who have moved away. Heteroskedasticity robust standard errors are given in parentheses. *** indicates significance at 1% level, ** at 5% level, and * at 10% level.
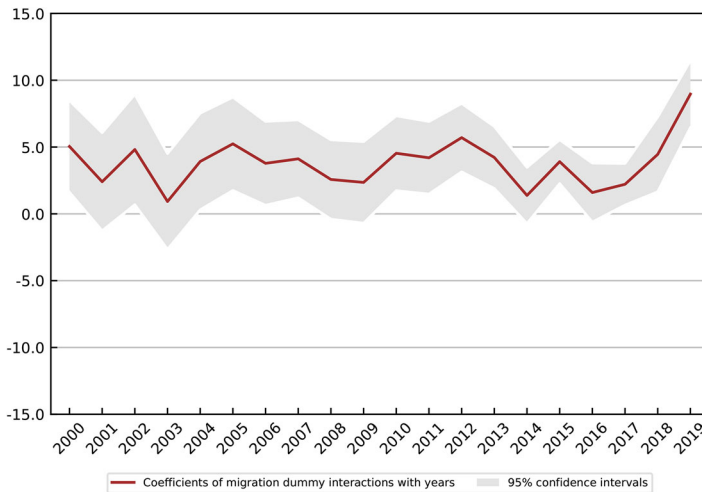Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

upward positional movement by 14.214 within income centiles. The results provide further evidence for the relationship between migration and income mobility. More migrating participants among family members underlies increasing income mobility, which means the degree of involvement with migration matters in affecting long-term dynamics of income profiles of households.

4.5. Migration and income mobility over time

We then investigate the timing of migration effects, providing some insights into the consistency of the relationship between households' decisions on migration and income mobility over time. To do this, we adjust Equation (1) to interact the migration variable with year dummies and then estimate a model with province F.E.s. The estimates of these interaction terms represent how the timing that households decide to migrate away affect their positional changes within income centiles. Figure 1 plots the estimated coefficients of migration dummy interactions with years for the mobility regressions. The grey areas show the 95% confidence interval. It shows a solid

Figure 1. The timing of migration and income mobility.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

effect of migration on income mobility during the past two decades. From 2000 to 2019, the upward movement of income positions fluctuates around 4 centiles after households choose to migrate. The latest estimates of interaction between migration and year dummies show a trend of ramping up from 1.60 to 8.96 since 2016, which means the effect of migration on mobility has been augmented in recent years. Migration behaviours adopted by households have a long-term rather than occasional impact on their income mobility.

5. Mechanism

A mechanism that may give rise to the results above is that the entrepreneurial behaviour caused by migration promotes household income mobility. A recent work of Mahé (2022) finds that migrants have higher inclination to undertake self-employed and entrepreneurial activities upon their return home than non-migrant households, since they have accumulated work experience and initial capital during emigration. The fact is also manifested by our data. In 2015, 17.85% migrant households start their own business, 4.09% more than those who are involved in entrepreneurship with no experience of migration. The situation statistically remains the same in the two latest waves of survey. The t-statistics show that the experience of migration significantly increases the proportion of entrepreneurship by 7.27% in 2017 and 9.93% in 2019. Therefore, we propose households' behaviour of migration has a positive impact on their participation in business venture.

The empirical results are provided using Equation (5) and shown in Table 7. The 2.S.L.S. and F.E. 2.S.L.S. estimates show that migration significantly increases the likelihood of entrepreneurship by 6% and 4.8%, respectively. Given that the average household entrepreneurial intention is 13.60%, the increased probability accounts for at least 35.29% due to migration behaviours. The results provide evidence that migration has significant economic effect on the involvement of family-owned business.

Table 7. Migration and entrepreneurial activities.

	(1) OLS	(2) 2SLS	(3) FE	(4) FE 2SLS
Migration	0.010***	0.060***	0.012***	0.048**
	(0.003)	(0.021)	(0.004)	(0.023)
Age	−0.005***	−0.004***	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
$Age^2/100$	0.002***	0.002***	−0.000	−0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Familysize	0.022***	0.020***	0.015***	0.014***
	(0.001)	(0.001)	(0.002)	(0.002)
Male	−0.001	−0.001	−0.003	−0.004
	(0.003)	(0.003)	(0.005)	(0.005)
Schooling	−0.002***	−0.003***	0.000	−0.000
	(0.000)	(0.000)	(0.001)	(0.001)
Workforceratio	0.032***	0.028***	0.013	0.010
	(0.004)	(0.005)	(0.008)	(0.008)
Maritalstatus	0.012***	0.012***	−0.002	−0.002
	(0.004)	(0.004)	(0.007)	(0.007)
Employment	0.074***	0.074***	0.039***	0.040***
	(0.003)	(0.003)	(0.004)	(0.004)
Health	0.034***	0.035***	0.007**	0.007**
	(0.003)	(0.003)	(0.003)	(0.003)
Rural	−0.093***	−0.094***	0.002	0.002
	(0.003)	(0.003)	(0.016)	(0.016)
$ln(Baseyearnetassets)$	0.005***	0.005***	−0.001**	−0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Household Fixed Effect			Yes	Yes
Province Fixed Effect	Yes	Yes		
Year Fixed Effect	Yes	Yes	Yes	Yes
Obs	65,854	65,854	65,854	65,854
Adj.R-sq	0.086	0.086	0.014	0.014
F value at First-stage		153.57		153.57
Cragg-Donald Wald F		1,547.261		1,547.261
Kleibergen-Paap rk LM statistic		1,238.580		1,238.580

This table reports the associations between the experience of migration and the engagement of entrepreneurship to elucidate the mechanism behind how income mobility is affected by migration. The dependent variable for all columns is a dummy variable indicating whether the household is engaged in self-employed business. Heteroskedasticity robust standard errors are given in parentheses. *** indicates significance at 1% level, ** at 5% level, and * at 10% level.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

Furthermore, it has been established that entrepreneurship can make the household income mobilise upward (Quadrini, 1999), thereby improving the distribution of incomes in a society (Banerjee & Newman, 1993). A large body of research has identified the impact of entrepreneurial activities on economic mobility. Lebergott (1976) conceives of a highly mobile wealth distribution inhabited by entrepreneurs rapidly accumulating and losing fortunes. Jarvis and Jenkins (1996) support this claim by examining the correlation between entrepreneurial initiative and wealth mobility, deducing that a successful start-up is associated with movement into the top decile. Quadrini (1999) has found that entrepreneurship plays an important role in stimulating upward mobility in that households are endowed with greater opportunities of moving into higher income classes. Quadrini (2000) replicates the main patterns of socioeconomic mobility that entrepreneurs enjoy disproportionately high upward mobility than those not engaged in venture development. Thus, it is reasonable to propose the mechanism of entrepreneurship playing a key role in the effect of migration on income mobility. The article suggests that entrepreneurial behaviour provoked by migration can further contribute to the promotion of household income mobility.

Table 8. Greater effect of migration on mobility for rural households.

	(1) OLS	(2) 2SLS	(3) FE	(4) FE 2SLS
Migration ∗ Rural	2.511***	1.878	4.605***	12.641***
	(0.540)	(1.744)	(1.037)	(3.997)
Migration	2.780***	10.530***	3.274***	23.676***
	(0.330)	(1.707)	(0.674)	(3.443)
Age	−3.727***	−3.650***	−1.175	−3.225
	(0.291)	(0.473)	(2.398)	(2.502)
Age^2/100	−0.226***	−0.169***	0.028	0.205
	(0.058)	(0.060)	(0.184)	(0.186)
Familysize	0.226***	0.175***	−0.005	−0.160
	(0.052)	(0.053)	(0.164)	(0.166)
Male	1.024***	0.718***	3.181***	2.155***
	(0.083)	(0.111)	(0.228)	(0.277)
Schooling	−0.832***	−0.900***	−0.837	−1.126*
	(0.279)	(0.279)	(0.675)	(0.677)
Workforceratio	0.084***	0.021	−0.006	−0.206*
	(0.030)	(0.033)	(0.103)	(0.108)
Maritalstatus	1.252***	0.761*	0.143	−1.598
	(0.382)	(0.401)	(1.142)	(1.174)
Employment $	0.464	0.474	1.768*	1.953**
	(0.336)	(0.337)	(0.941)	(0.944)
Health	3.446***	3.475***	7.117***	7.266***
	(0.284)	(0.285)	(0.602)	(0.603)
Rural	1.049***	1.128***	1.491***	1.742***
	(0.229)	(0.230)	(0.468)	(0.470)
ln(Baseyearnetassets)	−0.338***	−0.356***	−0.465***	−0.522***
	(0.031)	(0.031)	(0.060)	(0.061)
Household Fixed Effect			Yes	Yes
Province Fixed Effect	Yes	Yes		
Year Fixed Effect	Yes	Yes	Yes	Yes
Obs	65,854	65,854	65,854	65,854
Adj.R-sq	0.020	0.017	0.029	0.027
F value at First-stage		26.94		26.94
Cragg-Donald Wald F		794.197		794.197
Kleibergen-Paap rk LM statistic		1247.503		1247.503

This table reports the results from testing heterogeneous effect of migration on income mobility for rural and urban households. The interaction term between migration and rural dummies (Migration ∗ Rural) is introduced and tested. Heteroskedasticity robust standard errors are given in parentheses. *** indicates significance at 1% level, ** at 5% level, and * at 10% level.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

6. Heterogeneity analysis

6.1. Greater effect of migration on mobility for rural households

Most of the existing research on income mobility in China focuses on rural areas. Wenkai et al. (2007) envisage that the level of income mobility in rural China has always been higher than that in urban areas from 1986 to 2001. The main reason for the greater mobility of rural households after 1992 is the liberalisation of the interregional labour market, which significantly spurs the increasing proportion of household income from migrant workers. We introduce an interaction term of migration dummies and rural dummies.

Table 8 reports the urban–rural differences in the impact of migration on the household income mobility. In column (1), the O.L.S. result shows that the coefficient of interaction between migration and rural areas is 2.511, which is significant at the 1% level. The F.E. result is consistently positive and displays greater interaction effect. The F.E. 2.S.L.S. estimate shown in column (4) is 12.641 and significantly different

Table 9. Greater effect of migration on mobility for lower-income households.

	(1) OLS	(2) 2SLS	(3) FE	(4) FE 2SLS
*Migration * Lowerincome*	0.736	−2.186	4.801***	22.683***
	(0.489)	(1.584)	(0.813)	(2.664)
Migration	1.600***	6.659***	−0.133	5.085*
	(0.384)	(1.737)	(0.656)	(2.900)
Lowerincome	−26.329***	−25.660***	−51.612***	−56.287***
	(0.297)	(0.488)	(0.586)	(0.872)
Age	−0.009	0.014	−0.157	−0.008
	(0.054)	(0.055)	(0.159)	(0.160)
$Age^2/100$	−0.024	−0.045	0.126	−0.005
	(0.048)	(0.049)	(0.143)	(0.144)
Familysize	−0.204***	−0.332***	0.321*	−0.436**
	(0.077)	(0.100)	(0.186)	(0.222)
Male	0.243	0.224	−0.608	−0.840
	(0.258)	(0.259)	(0.572)	(0.574)
Schooling	−0.641***	−0.668***	−0.112	−0.263***
	(0.030)	(0.032)	(0.088)	(0.091)
Workforceratio	−0.611*	−0.802**	−1.666*	−3.243***
	(0.357)	(0.376)	(0.985)	(1.010)
Maritalstatus	−1.258***	−1.227***	0.772	0.838
	(0.314)	(0.315)	(0.805)	(0.804)
Employment	2.300***	2.305***	5.066***	5.157***
	(0.262)	(0.263)	(0.508)	(0.509)
Health	−0.567***	−0.549***	0.188	0.422
	(0.212)	(0.212)	(0.396)	(0.396)
Rural	−0.096	−0.112	0.727	0.692
	(0.247)	(0.248)	(2.092)	(2.091)
ln(Baseyearnetassets)	−0.594***	−0.601***	−0.445***	−0.487***
	(0.030)	(0.030)	(0.053)	(0.053)
Household Fixed Effect			Yes	Yes
Province Fixed Effect	Yes	Yes		
Year Fixed Effect	Yes	Yes	Yes	Yes
Obs	65,854	65,854	65,854	65,854
Adj.R-sq	0.160	0.159	0.292	0.292
F value at First-stage		275.79		275.79
Cragg-Donald Wald F		737.618		737.618
Kleibergen-Paap rk LM statistic		1196.141		1196.141

This table reports the results from testing heterogeneous effect of migration on income mobility for households with lower and higher yearly income. The interaction term between migration and lower-income dummies (*Migration * Lowerincome*) is introduced and tested. The dummy variable *Lowerincome* indicates whether the yearly income is less than the average income of total population. Heteroskedasticity robust standard errors are given in parentheses. *** indicates significance at 1% level, ** at 5% level, and * at 10% level.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

from zero, which means rural households almost experience additional 13-centile lift within income distribution than urban ones. The results indicate that the behaviour of migration has a greater effect on the upward mobility for households in rural areas.

6.2. Greater effect of migration on mobility for lower-income households

Zhu and Luo (2010) have recognised that poorer households often have stronger motivation to move, and their experience of migration can increase per capita income at a higher rate of growth than the more affluent cohorts. Arslan and Taylor (2012) assert migrant networks make significant growth in non-farm income, which is mostly pro-poor. Thus, we speculate that the impact of migration on income mobility may be heterogeneous because of the difference in income levels.

Table 10. Robustness test: Winsorise income.

	(1) OLS	(2) 2SLS	(3) FE	(4) FE 2SLS
Migration	3.762***	10.903***	5.298***	24.307***
	(0.269)	(1.691)	(0.527)	(3.443)
Age	−0.221***	−0.169***	0.023	0.167
	(0.058)	(0.060)	(0.184)	(0.186)
Age^2/100	0.221***	0.176***	−0.004	−0.131
	(0.052)	(0.053)	(0.164)	(0.166)
Familysize	1.039***	0.743***	3.190***	2.398***
	(0.083)	(0.108)	(0.228)	(0.267)
Male	−0.829***	−0.900***	−0.837	−1.102
	(0.279)	(0.279)	(0.676)	(0.677)
Schooling	0.083***	0.024	−0.010	−0.171
	(0.030)	(0.033)	(0.103)	(0.107)
Workforceratio	1.287***	0.785**	0.166	−1.280
	(0.381)	(0.400)	(1.142)	(1.169)
Maritalstatus	0.450	0.466	1.769*	1.925**
	(0.336)	(0.336)	(0.942)	(0.943)
Employment	3.419***	3.461***	7.087***	7.226***
	(0.284)	(0.284)	(0.602)	(0.603)
Health	1.052***	1.121***	1.495***	1.661***
	(0.229)	(0.230)	(0.468)	(0.470)
Rural	−3.124***	−3.196***	−0.289	−0.534
	(0.266)	(0.267)	(2.394)	(2.388)
ln(Baseyearnetassets)	−0.337***	−0.354***	−0.466***	−0.512***
	(0.031)	(0.031)	(0.060)	(0.061)
Household Fixed Effect			Yes	Yes
Province Fixed Effect	Yes	Yes		
Year Fixed Effect	Yes	Yes	Yes	Yes
Obs	65,854	65,854	65,854	65,854
Adj.R-sq	0.019	0.017	0.028	0.026
F value at First-stage		27.63		27.63
Cragg-Donald Wald F		1,547.261		1,547.261
Kleibergen-Paap rk LM statistic		1,238.580		1,238.580

This table reports the results of robustness tests by winsorising income to exclude the samples with income in the upper and lower 1%. Heteroskedasticity robust standard errors are given in parentheses. *** indicates significance at 1% level, ** at 5% level, and * at 10% level.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

Following Ling et al. (2018) and Li (2018), we define a dummy variable to measure the lower-income group if the yearly income of a household is less than the average income of total population. The interaction between migration and lower-income dummies is introduced. Table 9 presents the heterogeneity results. In column (3) and (4), the F.E. and F.E. 2.S.L.S. coefficients of interaction term are 4.801 and 22.683, respectively, both of which are significant at the 1% level. According to the F.E. 2.S.L.S. result, migrant households with lower yearly income improve their economic position by about 23 rankings compared with those in higher-income group. It shows that migration cause the greater promotion of upward mobility for poorer than richer ones.

7. Robustness tests

Tables 10–12 report the results of our robustness tests. In these tests, we winsorise income, collect samples of follow-up households in repeated surveys and measure income mobility as positional movement within income millesimals. The results of these tests are similar to our main results.

Table 11. Robustness test: Follow-up households.

	(1) OLS	(2) 2SLS	(3) FE	(4) FE 2SLS
Migration	2.998***	7.457**	4.138***	18.136***
	(0.472)	(3.142)	(0.741)	(5.326)
Age	−0.006	0.013	0.426*	0.535**
	(0.112)	(0.114)	(0.256)	(0.259)
$Age^2/100$	0.015	−0.002	−0.357	−0.452*
	(0.099)	(0.101)	(0.228)	(0.231)
Familysize	0.905***	0.717***	2.315***	1.727***
	(0.139)	(0.187)	(0.295)	(0.362)
Male	−0.310	−0.362	−0.548	−0.745
	(0.489)	(0.491)	(0.916)	(0.919)
Schooling	0.095*	0.062	0.082	−0.033
	(0.053)	(0.058)	(0.135)	(0.141)
Workforceratio	0.956	0.677	0.658	−0.359
	(0.648)	(0.683)	(1.486)	(1.537)
Maritalstatus	0.036	0.052	0.944	1.035
	(0.576)	(0.576)	(1.310)	(1.313)
Employment	3.653***	3.705***	7.703***	7.812***
	(0.473)	(0.474)	(0.807)	(0.808)
Health	1.375***	1.422***	1.179*	1.319**
	(0.393)	(0.395)	(0.642)	(0.645)
Rural	−2.437***	−2.502***	0.029	0.012
	(0.446)	(0.447)	(2.972)	(2.964)
$ln(Baseyearnetassets)$	−0.304***	−0.310***	−0.478***	−0.511***
	(0.049)	(0.049)	(0.077)	(0.078)
Household Fixed Effect			Yes	Yes
Province Fixed Effect	Yes	Yes		
Year Fixed Effect	Yes	Yes	Yes	Yes
Obs	22,281	22,281	22,281	22,281
Adj.R-sq	0.020	0.018	0.025	0.024
F value at First-stage		10.21		10.21
Cragg-Donald Wald F		436.490		436.490
Kleibergen-Paap rk LM statistic		361.543		361.543

This table reports the results of robustness tests by collecting samples of follow-up households in repeated surveys. Heteroskedasticity robust standard errors are given in parentheses. *** indicates significance at 1% level, ** at 5% level, and * at 10% level.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

7.1. Winsorise income

Considering that extreme values may cause estimation bias, this article winsorises households' incomes by excluding the samples with total income in the upper and lower 1%. In Table 10, all results using different estimation methods depict that the estimated effect of migration is slightly magnified compared with baseline results shown above. It means ruling out outliers helps to unveil the more unbiased effect of migration. The 2.S.L.S. and F.E. 2.S.L.S. results show that moving somewhere else significantly lead to upward income rankings by 11 and 24, respectively, which is consistent with the previous findings.

7.2. Follow-up households in repeated surveys

According to the statistics of the follow-up samples in repeated surveys for three consecutive years, households experiencing migration account for 15.322% and 23.415% in 2015, and 2019, respectively, an increase by 8.093% during the observation period. In this model, the number of observations shrinks to 22,281 from 65,854, but the F.E. and F.E. 2.S.L.S. estimates generally remain unchanged. It indicates the robustness of our results.

Table 12. Robustness test: Income mobility within millesimals.

	(1) OLS	(2) 2SLS	(3) FE	(4) FE 2SLS
Migration	37.549***	107.976***	52.830***	241.450***
	(2.690)	(17.005)	(5.275)	(34.422)
Age	−2.208***	−1.685***	0.279	1.704
	(0.584)	(0.598)	(1.840)	(1.858)
$Age^2/100$	2.206***	1.751***	−0.079	−1.346
	(0.517)	(0.529)	(1.639)	(1.655)
Familysize	10.376***	7.470***	31.917***	24.060***
	(0.829)	(1.075)	(2.280)	(2.666)
Male	−8.286***	−8.986***	−8.438	−11.072
	(2.786)	(2.809)	(6.756)	(6.771)
Schooling	0.824***	0.245	−0.078	−1.681
	(0.304)	(0.334)	(1.035)	(1.069)
Workforceratio	12.842***	7.887**	1.564	−12.792
	(3.815)	(4.012)	(11.418)	(11.686)
Maritalstatus	4.428	4.586	17.614*	19.167**
	(3.358)	(3.373)	(9.421)	(9.432)
Employment	34.126***	34.557***	70.831***	72.221***
	(2.837)	(2.852)	(6.018)	(6.026)
Health	10.538***	11.227***	14.977***	16.631***
	(2.290)	(2.307)	(4.684)	(4.698)
Rural	−31.243***	−31.960***	−2.992	−5.434
	(2.657)	(2.672)	(23.949)	(23.888)
$ln(Baseyearnetassets)$	−3.382***	−3.546***	−4.674***	−5.131***
	(0.310)	(0.314)	(0.605)	(0.609)
Household Fixed Effect			Yes	Yes
Province Fixed Effect	Yes	Yes		
Year Fixed Effect	Yes	Yes	Yes	Yes
Obs	65,854	65,854	65,854	65,854
Adj.R-sq	0.019	0.009	0.028	0.026
F value at First-stage		27.58		27.58
Cragg-Donald Wald F		1,547.261		1,547.261
Kleibergen-Paap rk LM statistic		1,238.580		1,238.580

This table reports the results of robustness tests by measuring income mobility as positional movement within income millesimals. Heteroskedasticity robust standard errors are given in parentheses. *** indicates significance at 1% level, ** at 5% level, and * at 10% level.
Source: Authors using the survey data from the Survey and Research Center for China Household Finance.

7.3. Income mobility within millesimals

The measurement of income mobility depends on the degree of refinement of income groups. We try to classify households into more refined groups along the income spectrum, so that the more detailed information of income mobility is easily preserved. For the purpose of robustness test, we further measure income mobility as positional movement within income millesimals instead of income centiles. The estimated coefficients of migration are as 10 times as those presented in baseline results. The F.E. 2.S.L.S. result shows that compared with samples who never experience migration during the observation period, migrant households averagely move upward by 241 positions within the income distribution that is divided into 1000 equal groups. The results provide robust evidence for the positive impact of migration on intragenerational income mobility.

8. Conclusion

Interest in the extent of mobility in household incomes over time has increased greatly in recent years. This article contributes to three realms of the economic

literature—migration, business venture and income mobility—in demonstrating how interregional migration affects intracohort mobility through its effect on entrepreneurial activities. We use unique data on Chinese households during 2015 and 2019 to examine the causal relationship between households' physical and financial movements. In our empirical results, households experiencing migration are more likely to participate in entrepreneurship and, consequently, enjoy greater promotion of their income rankings. Compared with non-migrants, migrants commonly have greater chances in both venturing into business and climbing income ladders. The results indicate that migration has a significant positive impact on household upward mobility within income groups, where whether starting businesses plays a significant role in between. To be specific, moving out of places of origin can robustly improve households' relative income positions *via* expanding their opportunities in starting up self-employed enterprises. We also show that migration can help poorer households achieve top tiers of income spectrum. Both higher level and quality of mobility imply that in the long term, regional income inequality has the potential to be alleviated because of the amelioration of stationary income distribution, which contributes to the inequality literature considering the effect of migration (Foltz et al., 2020; Giles, 2006; Hackl, 2018; Sun et al., 2014; Taylor et al., 2003; Zhu & Luo, 2010). Furthermore, increasing family members involved in migration enhance the migration effect on income mobility. Based on the timing that households decide to migrate away, this article also sheds new lights on the consistent association between migration and income mobility over time.

Our findings provide policy implications related to encouraging interregional migration. Households would benefit from moving away from their hometowns to a new residence, with a corresponding increase in their income mobility. In a society with a growing number of households experiencing upward mobility, longer-term inequality can get mitigated to avoid the rigidity of social stratification. Since the reform of the household registration system, settlement requirements have been gradually released in China, boosting intra- and inter-provincial migration, yet explicit and implicit restrictions on residence and movement of migrant population still exist in many cities, especially in megacities (e.g., Beijing, Shanghai, Guangzhou). The COVID-19 pandemic has also made interregional migration less easy than before. Our work provides evidence that sufficient economic mobility is casually and positively affected by the prevalence of migration. It implies the migration-encouraging policies become urgent in economies facing with the trend of income stagnation, including the removal of the barriers of migration movements and the limitations of settlement for immigrants. Future work that tests whether phasing out the household registration system dramatically affects the dynamics of income distribution, using a counterfactual analysis, would be an important contribution to the literature.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1. http://www.stats.gov.cn/tjzs/cjwtjd/201308/t20130829_74322.html
2. According to C.H.F.S., questionnaires about migration during the observation period have subtle variations to some extent. In 2019 and 2017 questionnaire, respondents are asked whether family members aged 16 and above have lived or worked in other places for more than half a year. In 2015 questionnaire, respondents are asked whether family members aged 16–60 had ever left their registered residence to work.

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