DETERMINANTS INFLUENCING THE DECISION OF INTERNAL MIGRATION IN THE CONTEXT OF AN EMERGING COUNTRY

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Abstract

Internal migration plays a crucial role in influencing real changes in local area population size and in facilitating the efficient functions of regional and national labor market and housing. This study is conducted to investigate the elements at the household level and others at the provincial level, which have impacts on the decision of personal migration. We used the database of household living standards surveys in 2010, 2012, and 2014 in Vietnam. Logit model was applied with array data to analyze determinants influencing the decision of personal migration. The results show that households with low living standards have a higher probability of migration. The provincial competitiveness index has a positive impact on the probability of households with migrants. The results provide the local authority with the foundation for regulation and distribution of the labor market on an effective basis. Based on the findings, some implications are proposed in the context of emerging countries and Vietnam as the case study.

Keywords: Drivers of Migration, Households' Living Standard, Provincial Competitiveness Index

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1. INTRODUCTION

It is necessary to conduct this household-oriented migration study as in Vietnamese households, especially those in rural areas, members are closely connected with each other. A member's migration is collectively decided and the household owner has the greatest impact on the family's decision. Previous studies using separate data and the act of collecting and connecting household data in 2010, 2012, and 2014 in the Vietnam Household Living Standard Survey (VHLSS) enabled the observation of migration behaviors (of at least one household member) and the analysis of relationships within the family. However, some concerning questions might include 1) Is the household's low living standard in the previous year one of many reasons for the migration of at least one of its members? 2) Does the migration of at least one of its members improve the household's living standard and if it does, what is the degree of improvement?

The connection of household information had a disadvantage which was the reduction of the sample's representativeness, however, it also had

some advantages that had not covered in the context of Vietnam, which covered the followings:

• It allowed the research of migration with the usage of lagged array data (a type of dynamic model). This model is greatly suitable when analyzing the impact of cause-effect in migration as well as evaluating whether the low standard of living in the previous period increases the probability of emigration in the following period or not.

• It allowed direct comparison of income and expenditure of households with migrant members with non-migrant households, and based on the findings, we provide analysis or evaluation of the migration decisions made by household members.

Coxhead, Nguyen, and Vu (2016) analyzed the impacts of some residence-related factors on migration. However, so far, there has not been research related to the impact of provincial determinants on households' migration using lagged array data. In practice, in provinces where capital investment and provincial competitiveness index (PCI) increase, the infrastructure as well as provincial executive management policies for firms are improved and this creates more jobs, maintains local employment, and reduces the probability of emigration. In this research, with the explanation that the impacts of macro determinants on migration are not immediate (all in the same year) and it requires the temporal lag, we place the capital investment and number of newly-created jobs in the lagged period in the model to analyze the probability of migration by at least one of the household members. The results show that when these variables increase, the probability of migration decreases. It provides experimental evidence to support provincial leaders in their process of making appropriate policies to regulate migration and improve provincial growth.

The research is structured as follows. Section 2 reviews the suitable literature on migration motivation. Section 3 describes the data and methodology employed. Section 4 sets out key results. Section 5 reveals some discussion, while Section 6 shows some key conclusions and implications of the study practice and potential further research.

2. LITERATURE REVIEW

The analysis model of migration's drivers can be understood as the model which concentrates on analyzing factors influencing people's decision to migrate. This model was studied by different scientists. Ruyssen, Everaert, and Rayp (2012) analyzed drivers of migration in 19 nations in OECD from 1998 to 2007 and discovered that the main drivers were higher income and economic growth in the destination that people migrate to. Job opportunities and welfare were also the determinants enhancing the motivation for migration. Theories of migration decisions also can be found in studies conducted by Greenwood (1997), Borjas (1999), Chiswick (1999), and Bauer and Zimmermann (1999). Accordingly, the migration was a result of differences in living standards between areas (Harris & Todaro, 1970). Therefore, differences in income, unemployment rate, cost of living, public goods, and technology transfer were also important determinants influencing migration. The decision to

migrate was influenced by factors of costs including tangible costs such as transportation cost, income cost, and intangible costs such as complicated emotions due to the separation from family and friends. The ability to migrate would decrease the older the person gets. People with high qualifications would more likely to migrate as migration-related risks were reduced as these people were more likely to find jobs with high income as well as they had the better ability to process information in the new location. The distance between the original location and the destination, named migration length also affected migration decisions. The family environment also played an important role in the decision-making process (Mincer, 1978). Overall, migrants' decision to migrate depended on their individual characteristics (Borjas, 1999; Chiswick, 1999). Some studies affirmed that the decision was closely associated with the fact the person had ever migrated or not. Gordon and Molho (1995) discovered that 90% of surveyed British migrants who planned to migrate had already migrated in the previous five years. Dustmann (2003) with his array data in studying the migration back to Germany concluded that from 1984 to 1997, there were 84% of respondents who had migrated before 1984 had the intention of migrating back to this country.

Zhang and Song (2003) conducted a study on rural-to-urban migration in China during 1978–1999. They used cross-sectional data with a linear regression model, in which net urban immigration was the dependent variable, and independent variables included differences in income between urban and rural areas, GDP growth, land capital, and the movement of labor from agriculture to the non-agricultural field. The results showed that these independent variables could explain 32% of the changes in urban migration rates in China. Furthermore, Zhang and Song (2003) observed that the GDP growth rate had a significant impact on the immigration rate.

Syafitri (2013) investigated the factors influencing the decision of laborers in East Java, Indonesia, to migrate based on the new economics of labor migration (NELM). He analyzed the drivers of rural-urban migration, international migration, and non-migration. The findings also demonstrated that the local government contributed significantly to reducing migration by supporting market entry and access to credit, stimulating investments to improve agricultural productivity and income of rural households.

Mahinchai (2010) broke into the impact of household and individual characteristics on migration decisions in Nam Rong province, Thailand, by using the multinomial logistic model. The results revealed that these characteristics remarkably influenced migration decisions indicated that policymakers should also consider migrants' choices in their different destinations.

Mendola (2008) investigated the impact of household-related and residence-related determinants on households with at least one member to migrate through using the logistic model. He found that rich families were more likely to migrate internationally and achieve higher labor productivity. However, poor families could only migrate domestically, do simple jobs with low productivity, while in families with greater economic conditions, their members

could afford professional vocation training courses in order to have the capital for international migration to achieve higher income and productivity.

In addition to the groups of determinants mentioned above, an overview of migration showed that migration was also influenced by "distance" and "peer pressure", for example, the migration of people in the same village, family members, peers or classmates could all influence the migration decisions of migrants.

Nguyen et al. (2008) employed the Probit model to analyze the impacts of household-related factors and commune-related factors on the probability of a household having a member who has a long-term migration (from 6 to 12 months) and the probability of a household having a short-term migrant member (from a month to less than 6 months). The results showed that migration was a highly selective process and strongly influenced by household-related determinants as well as commune-related determinants. They also analyzed the effects of migration on household expenditure and inequality. Migration had a positive effect on household expenditure but it increased the Gini coefficient of per capita expenditure from 0.38 to 0.42.

Coxhead et al. (2016) employed logit and multinomial logit models to analyze the influence of individual, household, and commune-related characteristics on the probability of labor migration, non-labor migration (marriage), and non-migration

(non-migrant status). The results combined with the 2012 VHLSS data demonstrated that the probability of migration was closely related to the individual, household, and commune-related factors. Migration was seen by households as a part of the strategy for investment diversification. Young people were more likely to migrate. Women were more likely to migrate for non-labor purposes than men because women were more likely to marry and live with their husbands in other provinces. Drought was also seen as a significant "push" factor towards labor migration. Household members in the ethnic minority group migrated at a much lower rate than the Kinh/Hoa people did.

Migrant labor forms a part of human resource management. Onyoin (2020) provided an analysis with the practical classification of purposes-based management like hiring, retraining, compensating as well as labor relationships to find out policy implications for public-private partnership at the national level.

3. RESEARCH METHODOLOGY

The logit model with array data is employed to analyze the probability of a household having at least one member who emigrated:

$$P(migration_{it} = 1/X_{it}) = \frac{exp(\alpha_i + X'_{it}\beta)}{1 + exp(\alpha_i + X'_{it}\beta)} \qquad (1)$$

where, $i = 1 \div 1914$, $t = 2010; 2012; 2014$.

X is a vector of independent variables in the model analyzing the probability of a household with at least one member who emigrated, the vector of independent variables X includes the following groups of variables:

1. Group of variables related to the characteristics of household owner: gender, qualifications, age.

2. Group of variables related to households: real spending per capita, proportion of dependents, proportion of laborers with university qualifications

or higher, and variables controlling the living standard include the type of house, water source for eating and drinking, type of toilet.

3. The group of variables related to the external environment includes provincial variables related to migration such as PCI, capital investment, number of newly-created jobs.

β is the vector of the coefficient which needs estimation.

α_i is the intercept for household i.

Dependent variable:

$$migration_{it} = \begin{cases} 1 \text{ if the household has at least one emigrant} \\ 0 \text{ if the household has no emigrants} \end{cases}$$

The General Statistics Office already created the migration variable (households with emigrants) for each year in 2010, 2012, and 2014 data sets and had household codes to link the data for the three years including 2010, 2012, and 2014.

General Statistics Office created migration variable (household with migrants) for each year, which is covered in the database of Vietnam Household Living Standard Survey in 2010, 2012, 2014. The Office also used household code to link the database of variables in those years. The database for each year of 2010, 2012, and 2014 included 9,399 households surveyed nationwide. In Vietnam, there are 63 provinces and cities at the central level; 705 administrative agencies at the district level, and 10,614 at the commune level. Previous surveys selected 3,133 communes among those 10,614 ones, of which the number of surveyed households was 3. The survey in 2012 restudied

certain households in the research in 2010 with the same household code. Similarly, the study in 2014 recovered the households in 2010 and 2012 with the same code. The total number of households with the same code for research in 2010, 2012, and 2014 was 1,914. We linked the database of related variables to run the model. The panel data was 1,914 households in 3 years (2010, 2012, 2014), equal to 5,742 observations.

The research linked the migration variable in 2010, 2012, 2014 data sets based on the questionnaires in the 2012 and 2014 surveys.

Independent variables

Determinants influencing the ability to migrate are characteristics of the household owner and household, living standard (meso factor), and development characteristics of the province (macro factor). Characteristics of the household owner and household include gender, age, household owner's

qualifications, dependency ratio, the proportion of laborers with a university degree in the household.

The study identified that there are two groups of determinants influencing drivers of migration of a family member and they are external and internal factors, respectively. Using previous studies as illustrated, we also identified two groups of determinants that affect drivers of migration of household members which are demonstrated below:

Table 1. Groups of determinants influencing the drivers of emigration

Group	Details
"Internal" group	First, those are related to the migrants themselves (such as gender, age, marital status, qualifications, work skills). Second, those are related to the migrant's household such as characteristics of the household owner, the standard of living presented via the average real spending of the household, the living environment of the household (such as type of house, water, toilet).
"External" group	It includes provincial-level factors such as infrastructure (via capital investment), number of newly-created jobs, provincial competitiveness index (PCI).

3.1. Variables of characteristics of the household owner

In fact, the household owner plays a huge role in the household. Therefore, a hypothesis is presented which states that the characteristics of the household owner also strongly influence the migration decisions of household members. Therefore, we place this group of variables in the model.

Gender of the household owner: This variable is used to examine whether the differences between a male and female owner have different impacts on the probability of having a member in the household emigrate. This variable is coded in the model as a dummy variable.

Educational qualifications of the household owner: We employed this variable to explore the impact level of high educational qualifications (for example, undergraduate degree) on the probability of having emigrants. We suppose that the household owner with high educational qualifications will give other members of the household a good orientation in terms of education and vocational training so that they can find suitable jobs in their current place of residence without having to emigrate. This variable is a hierarchical qualitative variable and we select level 2 (the level in which the household owner has the lower secondary school diploma) as the reference status according to the 2014 statistics of diploma by household owners and the results showed that the mean is 1.99.

Age of the household owner: This variable is used to investigate at what age group the household owner is most likely to have members that emigrate. The age of the household owner reflects the experience as well as the maturity in their thinking which affects the orientation of other household members. On the other hand, the age also periodically demonstrates the connection among household members is close or not, their children are at school age or have grown up. This variable is also a hierarchical qualitative variable and we select level 2 (aged from 30 to 39) as the reference status. Household owners in this age group have begun to settle down with their own family, they have to make decisions about where to live in order to be suitable with the workplace of the household members. Therefore, they often have to make a decision whether to migrate or not.

3.2. Group of variables of living standards

Pursuant to the Prime Minister's Decision No. 43/2010/QD-TTg dated June 2, 2010, on the system of national statistical indicators measuring the living standard of the Vietnamese population and the availability of data in the VHLSS data set for 2010, 2012, and 2014, selected indicators of the household living standard include:

Real expenditure per capita: This is an important variable in the analysis model as it illustrates how a household's living standard in different expenditure categories will impact differently on the probability of that household having at least one member who emigrates. The study used spending groups divided by quintiles developed by The World Bank (WB) for the VHLSS of 2010, 2012, 2014. The third percentile is chosen as the reference status compared with the two lower levels of expenditure being levels 1 and 2 and the two higher levels of expenditure being levels 4 and 5.

The study selected one-period lagged values of "households' expenditure" variable to analyze due to two reasons, including 1) to test whether the lower living standard than the average in the previous period of some households increases the probability of emigration in the following period or not; 2) to avoid the reverse impacts of the "migration" variable on the "households' expenditure" variable.

The dependency ratio: This variable is determined by the total number of people under working age (under 15 years old) and people over working age (over 65 years) divided by the total number of people in working age (from 15 to 64 years old), all people are household members. When using this variable, the hypothesis is the higher the ratio is (a member of working age has to take care of many members with without working age), the higher probability of migration will be.

The ratio of working members with an undergraduate degree: This variable is identified through the number of working members with an undergraduate degree divided by the total number of members of working age. The variable is used to determine the possibility of migration labors with undergraduate degrees.

3.3. Group of variables related to households' living environment (control variables)

Type of house, water source, toilet type are variables that reflect the household's living standard. These variables serve as control variables which help the analysis be more detailed and strict. In addition to an income, that represents the immediate economic condition, other determinants, such as type of house, water source, toilet type can help the identification of the household's long-term economic potentials. Households with an unstable structure are more likely to make efforts in looking for jobs; therefore, their motivation to migrate is

great. The research provides a hypothesis which states that in poor households, members of working age always want to migrate to find jobs. However, if the household is too poor, even if they want to migrate, there are other issues affecting their decision such as minimum cost in the new location, house rental fee, and food cost.

3.4. Group of "external" variables: Some province-related indicators relating to migration

Provincial competitiveness index: PCI is the result of one of the biggest and most comprehensive sociological surveys in Vietnam and it is used as a vital tool to measure and evaluate the economic management and execution in 63 provinces in nine important industries which greatly affect the development of the non-state sector. Research of PCI also contributes to developing the indicator to assess the infrastructure quality at the provincial level which is considered one of the biggest obstacles for investment. This factor is employed to evaluate the influence of the economic management and execution at the provincial level (a variable representing the institution) on migration (Syafitri, 2013). The hypothesis states that provinces with effective PCI will reduce the migration (as high PCI means the economic management and execution of that province are considered as being effective and this attracts investment and increases the number of jobs, and laborers will likely stay in the province

to work and not migrate to look for jobs) (negative value of expectation).

Provincial capital investment: One-period lagged values are used with this variable to evaluate when the capital investment in the last period increased, would the probability of emigration decrease? (a negative value of expectation). Reality shows that when the provincial capital investment increases, it attracts more investors to establish new companies in the local area and this creates more jobs for laborers and this reduces their expectation to emigrate.

A number of newly-created jobs in the province: One-period lagged values are used with this variable to discover whether the province with a large number of newly-created jobs in the last period can attract the laborers to stay in the province and not migrate (negative value of expectation).

Description and values of the independent variables in the drivers of migration analysis model in 2010, 2012, 2014 are illustrated in Table A.1 (Appendix). We estimate the aggregate model, then employ the random-effects model (REM), fixed effects model (FEM) for choosing the suitable model for processing this kind of data.

4. RESEARCH RESULTS

We use the data collected from Vietnam Household Living Standard Survey. The detailed description of households with emigrants is represented as below:

Table 2. The number and percentage of households with emigrants in 2010, 2012, 2014

Items	*2010*		*2012*		*2014*	
	Quantity	*%*	*Quantity*	*%*	*Quantity*	*%*
Households with no emigrants	8,548	90.1	6,462	68.7	8,498	90.5
Households with at least one emigrant	854	9.9	2,937	31.3	894	9.5
Total number of households	9,402	100	9,399	100	9,392	100

Source: Compilations by the authors.

It can be seen that in 2010, in 9,402 surveyed households, there were 8,548 households without emigrants, accounting for 90.1%, and 854 households with at least one emigrant, occupying 9.9%. In 2012, in 9,399 surveyed households, there were 6,462 households without emigrants, occupying 68.7%

and 2,937 households with at least one emigrant, accounting for 31.3%. In 2014, in 9,392 surveyed households, there were 8,498 households without emigrants, accounting for 90.5%, and 894 households with at least one emigrant, occupying 9.5%.

Table 3. The number and proportion of households with emigrants in 2010, 2012, 2014

Items	*2010*		*2012*		*2014*	
	Quantity	*%*	*Quantity*	*%*	*Quantity*	*%*
Households with no emigrants	1,713	89.5	1,259	65.8	1,733	90.5
Households with at least one emigrant	201	10.5	655	34.2	181	9.5
Total number of households	1,914	100	1,914	100	1,914	100

Source: Compilations by the authors.

The total number of observations in the dataset of three years (2010, 2012, and 2014) was 5,742 households. Of which, 1,037 observations were households with emigrants, accounting for 18%, and the remaining 4,705 observations were households with no emigrants, making up 82%.

The study respectively estimated the aggregate model: the random-effects model and the fixed-

effects model and used comparative tests to find the most suitable model for analysis. By using the Hausman testing, we discover that the suitable model is the fixed-effects model.

Since there are provincial variables in the model (capital investment, number of newly-created jobs, and PCI), it is necessary to evaluate the relationship of these variables in the model.

Table 4. A correlation coefficient of provincial variables

	Lvondt	*Employment*	*PCI*
Lvondt	1		
Employment	0.793	1	
PCI	0.15	0.146	1

Source: Compilations by the authors.

It can be seen that the correlation coefficient of the "number of newly-created jobs" variable with the "capital investment" variable and with the PCI variable are 0.793 and 0.146, respectively. It means that if capital investment, as well as the PCI, increases, the number of newly-created jobs also increases. Although the correlation coefficient of the "number of newly-created jobs" variable with the "capital investment" variable is 0.793 which is relatively high, the logit model with the array data is estimated by the most suitable method, therefore, this relationship has little impact on the estimated quality of the model.

Table 5. Results of the fixed-effects model

Variables and its attributes	FEM value
Gender of the household owner (female is the reference status)	0.2247148***
Age of the household owner (age group 30–39 is the reference status)	
16–29	1.079443***
40–49	3.379227***
50–59	3.614156***
≥ 60	3.092064***
Qualifications of the household owner (not attending school or having a primary school degree is the reference status)	
Secondary school degree	0.4864661***
High school degree	0.7754918***
College or undergraduate degree	1.3237430***
Dependency ratio	0.2162958***
Undergraduate degree ratio	-0.9493506***
Group of indicators related to the average real expenditure of the household (one-period lagged values) (percentile 3 is the reference status)	
Group of percentile 1	0.4704270***
Group of percentile 2	0.1584617***
Group of percentile 4	-0.4052619***
Group of percentile 5	-0.7445187***
Type of house (temporary house and other types is the reference status)	
Permanent	0.0375316***
Semi-permanent	-0.5436579***
Water source (rainwater/other types are the reference status)	
Tap water	0.0622998***
Well water	0.0387055***
Type of toilet (not having a toilet is the reference status)	
Septic	0.8976571***
Raw	0.6460515***
Number of newly-created jobs (one-period lagged values) [*Employment*(-1)]	-0.0000193***
Loga capital investment (one-period lagged values) [*Lvondt*(-1)]	-7.073884***
Provincial capital investment	-0.0928696***
Number of observations	922

*Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*
Source: Compilations by the authors.

5. DISCUSSION

First of all, it should be noted that when linking data of VHLSS in 2010, 2012, 2014, there were 1,914 households in each year and each of these households was observed in 2010, 2012, and 2014. This shows that the linking reduced the sample size and the representativeness of the sample and therefore impacted the estimation results. However, the data linkage had the advantage of showing information changes in the status of migrants over time.

5.1. Measurement results of groups of variables related to the household owner

The findings demonstrated that if the household owner has qualifications higher than a secondary school degree, the probability of family members emigrating increases. In this circumstance, the household owner helps the members have a more effective orientation of education and training and when they do emigrate, they will find the job being suitable with their skills and increase their productivity and opportunities to have a higher income.

The older the household owner is, the higher probability of family members will emigrate. Specifically, households with the household owner aged under 30 have a lower probability of family members emigrating than those with the household owner aged from 30 to 39. In contrast, households with the household owner aged above 40 have a higher probability of family members emigrating than those with the household owner aged from 30 to 39. It can be explained that the household owner being under 30 are often young married couples with little kids and the commitment in the nuclear family is high, therefore, there are only a few members who wish to migrate. On the other hand, households with the household owner aged above 40 have a higher probability of family members emigrating than those with the household owner

aged under 40. In fact, when the household owner enters their 40s, their children will often enter adulthood and start to look for jobs and the commitment among members is no longer close. This is the reason for the migration of some members in the household.

5.2. Measurement results of groups of variables related to the household's living standard

The estimated coefficients of the one-period lagged variable of real expenditure per capita in analyzed households showed that households with real expenditure per capita in the previous year being lower than the reference level (the mean in the quintile) have a higher probability of having someone emigrating in the following year. It can be seen that households with low real expenditure per capita (being less than 1 million Vietnamese dong/person/month in 2010), these households wish to migrate to improve their living standard. In contrast, the results illustrated that households with expenditure per capita in the previous year being higher than the reference level have a lower probability of having someone emigrating in the following year. It indicates that these are households with better "living conditions", so the probability of emigration is lower than the reference level.

The outcomes also demonstrated the positive correlation between households with a high dependency ratio and the probability of emigration. This complies with the hypothesis as the high dependency ratio means that "few earners and more followers", and it leads to great pressure on household spending. This increases the need to achieve better employment and higher income and the probability of having household members emigrating.

Households with permanent houses are more likely to emigrate than households with temporary houses, but households with semi-permanent houses are more likely to emigrate than households with temporary and other types of houses.

Type of house, water source, and type of toilet are the "control variables" which represent households' living conditions in the long term. In addition to the need for eating, households always wish to invest in building houses, repairing houses, and toilets. Underdeveloped conditions of housing and toilets show that poor living conditions are the driver of household members' expectation to migrate.

Thus, regarding the group of variables related to households, it can be seen that the low standard of living increases the motivation to migrate. This finding shows that migration in Vietnam is still a livelihood strategy to help households "reduce poverty", not a means to help households "be rich and develop".

5.3. Measurement results of groups of variables related to the province

The estimated coefficient for the one-period lagged variable of the variable named "number of newly-created jobs" is -0.0000193 (< 0, and statistically significant at 1%), which shows that when the number of newly-created jobs in the previous

year of the province increased, the probability of households in that province having members emigrating would decrease. The results are compatible with the reality as when there are many newly-created jobs, people will stay in the local area to work and reside.

The estimated coefficient of the PCI variable is –0.0928696 (< 0), which indicates that when the PCI increases, the probability of emigration among household members decreases. Increased PCI means that enterprises offer positive evaluations on the management and administration as well as the transparency of the local government. These firms will continue to operate in the province and continue to create jobs. As a result, the probability of households in that province having members emigrating is reduced.

The estimated coefficient of the one-period lagged variable of the loga variable named capital investment is -7.073884 (< 0), which indicates that when the capital investment increases, the probability of households having members emigrating will decrease. It shows that the province with increased capital investment in the previous period helps improve infrastructure and attract investment, which creates many jobs, attracts more workers, and therefore the probability of households having members emigrating is reduced.

6. CONCLUSION

The average expenditure per capita in the household in the previous period was lower than the average expenditure threshold and this increased the motivation to emigrate in the later period. This is the driving force that causes household members to migrate. The outcome demonstrates a policy implication which is regarding policies supporting households, especially poor households, it will be vital to pay attention to "making loans" to the household members who migrate if they migrate to find job opportunities and improve their family income.

Female household owners, high dependency ratio, and poor living conditions are factors that promote household members to migrate. It shows that migration in Vietnam is still a livelihood strategy to help households "reduce poverty", not a means to help households "be rich and develop". In the future, it is very important to have policies to encourage migration with the target of "enrichment and development" among individuals, households, and local communities.

Based on the findings, it is clear that households with low living standards are more likely to have members emigrating. Therefore, the government should have credit support policies for them so they can migrate to improve their living standard for their households. If the provincial government wishes to keep workers stay in the province, it should create more jobs through increasing capital investment, improving the investment environment, business environment, improving the PCI.

The enhancement of human capital should be carried out via promoting quality education and training, developing policies to support citizens to complete the general education. It is also necessary to improve vocational training to meet labor

demands in urban areas in various professions such as refrigeration, electronics, informatics, construction, and housekeeping. It is important to consider housekeeping as a profession with necessary knowledge and skills such as cooking, cleaning, communication, honesty. During the training of professional qualifications for laborers, it is essential to provide them with soft skills such as work ethics, responsibility, and professionalism. Social knowledge is also a vital aspect that the laborers should be equipped with. The enhancement of social knowledge can be implemented through the establishment of the Women's Union, Farmers' Association, and the promotion of reproductive health, knowledge, and skills to prevent social ills such as gambling, drugs, prostitution which have a complicated presence in urban areas.

However, there are some limitations of the study. The three-year dataset of 2010, 2012, 2014 is short compared to the model with array data. We have access to the 2016 VHLSS dataset, but unfortunately, the household index of the 2016 survey has changed, which has not allowed us to connect the data of variables for analysis as we did in this study. This research only provides an assessment of "place of departure", i.e., the decision to emigrate without evaluation of "destination". Further study should focus on "destination" as a continuation of the migration process. A research direction that is also of great interest is "return migration", i.e., people who migrate to urban places for working but the impact of COVID-19 pandemic, they are unemployed and forced to "return migration" to the place where there were born.

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APPENDIX

Table A.1. Description and values of the independent variables in the drivers of migration analysis model in 2010, 2012, and 2014

Variables	Description	Values of the variables
Mig	Migration	0: Households with no emigrants 1: Households with emigrants
Gen_hh	Gender of household owner	1: Male 0: Female
Qualifications_hh	Qualifications of the household owner	1: Not go to school or only has primary school degree 2: Has secondary school degree 3: Has high school degree 4: Undergraduate degree or higher
Age_hh	Age of household owner	1: from 16 to 29 2: from 30 to 39 3: from 40 to 49 4: from 50 to 59 5: above 60
Expen_hh (divided by 5 percentiles)	Real household expenditure per capita (thousand VND)	**Year 2010** Level 1: from 1,205 to 8,152 Level 2: from 8,185 to 11,716 Level 3: from 11,725 to 16,181 Level 4: from 16,211 to 24,139 Level 5: above 24,312 **Year 2012** Level 1: from 2,066 to 11,763 Level 2: from 11,796 to 16,799 Level 3: from 16,817 to 22,867 Level 4: from 22,912 to 32,985 Level 5: above 33,008 **Year 2014** Level 1: from 2,777 to 14,398 Level 2: from 14,442 to 20,482 Level 3: from 20,507 to 27,647 Level 4: from 27,693 to 39,358 Level 5: above 39,568
Depen_ratio	Dependency ratio	(Number of members under working age + Number of members over working age)/(Number of members in working age)
Un_grad_ratio	Undergraduate degree ratio	The value is in (0;1)
Type_house	Type of house	1: Permanent 2: Semi-permanent 3: Temporary/other types
Water_S	Water source (eating, drinking)	1: Tap water 2: Well water 3: Rainwater and others
Toilet_type	Toilet type	1: Septic/semi-septic 2: Raw 3: Not have toilet/other toilet types
PCI	Provincial competitiveness index	The value ranges from 45.12 to 69.77
L(Pro_cap_invest)	Loga (provincial capital investment)	The value ranges from 14.85 to 19.27
Jobs	No. of newly-created jobs in the province	The value ranges from 7.5 to 12.22

Note: VND is a Vietnamese dong (a currency of Vietnam).