Migration in Vietnam: New Evidence from Recent Surveys

Coxhead, Ian and Vu, Linh and Nguyen, Cuong

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Ian Coxhead[a]
Nguyen Viet Cuong[b]
Linh Hoang Vu[c]

Abstract

We investigate determinants of individual migration decisions in Vietnam, a country with increasingly high levels of geographical labor mobility. Using data from the Vietnam Household Living Standards Survey (VHLSS) of 2012, we find that probability of migration is strongly associated with individual, household and community-level characteristics. The probability of migration is higher for young people and those with post-secondary education. Migrants are more likely to be from households with better-educated household heads, female-headed households, and households with higher youth dependency ratios. Members of ethnic minority groups are much less likely to migrate, other things equal. Using multinomial logit methods, we distinguish migration by broad destination, and find that those moving to Ho Chi Minh City or Hanoi have broadly similar characteristics and drivers of migration to those moving to other destinations. We also use VHLSS 2012 together with VHLSS 2010, which allows us to focus on a narrow cohort of recent migrants—those present in the household in 2010, but who have moved away by 2012. This yields much tighter results. For education below upper secondary school, the evidence on positive selection by education is much stronger. However, the ethnic minority "penalty" on spatial labor mobility remains strong and significant, even after controlling for specific characteristics of households and communes. This lack of mobility is a leading candidate to explain the distinctive persistence of poverty among Vietnam's ethnic minority populations, even as national poverty has sharply diminished.
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[a] University of Wisconsin-Madison, USA. Email: coxhead@wisc.edu
[b] National Economics University and Mekong Development Research Institute, Hanoi, Vietnam. Email: cuongwur@gmail.com
[c] World Bank, Hanoi, Vietnam. Email: lvu5@worldbank.org

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1. Introduction

Internal migration is a standard and prominent feature of every low-middle income country, and especially of those undergoing rapid growth and structural change. Growth rates are highly unequal across broad industries, and since industries are unequally distributed across space, unbalanced growth creates incentives for labor to move. Thus, changing patterns of labor demand align with one of the main objectives of migration, which is to increase and stabilize the incomes of migrants as well as those of their origin households (Stark and Bloom, 1985; Stark and Taylor, 1991; Stark, 1991; Borjas, 2005).

Economists as well as policy makers have been long interested in understanding the causes of migration. There are many perspectives on the migration decisions of individuals or households. In conventional theory, individuals relocate to maximize utility given spatial variation in wage and price levels (Molloy, 2011; Valencia, 2008). In the New Economics of Labor Migration, decisions to migrate depend on characteristics of both migrants and their families (Stark and Bloom, 1985; Stark and Taylor, 1991). Amenities and/or community characteristics of home and destination locations are also considered to be important factors exerting 'push' and 'pull' forces on migrants (Mayda, 2007; Kim and Cohen, 2010; Ackah and Medvedev 2012), or to limit outmigration through attachment to place-specific kinship or cultural attributes (Dahl and Sorenson, 2010). Social factors are known to be important because the "trigger price" for migration—that is, the expected income differential between origin and destination—is always found to be much larger than the simple financial cost of relocating (Davies, Greenwood and Li 2001). More recently still, global climate change has been responsible for creating differences among locations. Some areas that were once well suited to particular forms of agriculture are now vulnerable to drought or other adverse conditions. Changes in agricultural yields were found to influence migration rates in a study of U.S. counties (Feng, Oppenheimer and Schlenker, 2012). Tropical areas are experiencing increased susceptibility to storms, saline intrusion and flooding, and these environmental factors may be increasingly influential as drivers of migration in the future.

Labor mobility improves the efficiency with which workers are matched with jobs. This contributes to an increase in net income both for individuals and for the economy as a whole. Labor migration is a special case of spatial labor mobility, typically from locations where capital and other factors that raise labor productivity are scarce to locations where they are more abundant. Remittances are a mechanism for redistributing the net gains from increased spatial labor mobility. They spread these gains from migrants to the population at large (McKenzie and Sasin, 2006). Since migration is usually from regions in which labor productivity (and hence low per capita income) is

low to regions where it is high, remittances typically contribute to poverty alleviation (e.g., Adams and Page, 2005; and Acosta et al., 2007).

Vietnam's rapid economic growth has been accompanied, as in many other parts of the developing world, by increasingly high levels of geographical labor mobility. While international migration is significant, most migrants still move within the country—and indeed, most go to a relatively small number of internal destinations. Vietnam is small and geographically compact relative to many other well-studied developing countries. From Da Nang, in the center of the country, to either of the two major cities (Hanoi or Ho Chi Minh City) is less than 800km, or 14-16 hours by bus. Relatively short distances, coupled with near-universal access to mobile phones, mean that contemporary migration is much less costly and risky than in many other countries or in Vietnam's own past. Potential migrants can learn about job opportunities, resettlement costs, and other important considerations in destination cities before deciding on a move. In this setting there is likely to be very little speculative migration accompanied by urban unemployment as in the famous model of Harris and Todaro (1970). Unemployment in destination markets is more likely to be frictional than structural.

Economic growth and lower migration costs have been associated with large increases in migration. Vietnam's 1989 census recorded very few internal migrants; the majority was from one rural location to another, and their motives for relocating were a mix of economic and other factors (Dang, 1999).[1] This changed quickly as economic growth accelerated in the 1990s. According to the 1999 Census, 4.5 million people changed location in the five-year interval 1994-99. By this time the economic reform era was well under way, and the surge in spontaneous migration was also driven far more explicitly by income differentials (Phan and Coxhead, 2010). By the next census in 2009 this five-year migration figure had increased by almost 50%, to 6.6 million (Marx and Fleischer, 2010), or almost 8% of the total population. Again, a large fraction of those who moved did so for economic reasons. Vietnam's economic growth since the early 1990s has been dominated by secondary and tertiary sectors, with a big contribution from foreign investment and the reform of state-owned enterprises. Changes in the sectoral and institutional structure of labor demand have mirrored these trends (McCaig and Pavcnik, 2013). Growth of employment and labor productivity in Vietnam is overwhelmingly in non-farm industries and urban areas.

Moving to where job prospects and earnings growth are higher is sensible for most individuals, subject to cultural and behavioral norms, transactions costs and other constraints. Promoting labor mobility and remittances is also in general good development policy. Therefore, understanding the drivers of migration and remittances is an input to policy recommendations for

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[1]The census identifies an individual as a migrant if he/she was at least five years of age at the time of the census and had changed place of residence within the past five years.

development. The main objective of this research is to investigate the dynamics of the individual migration decision in Vietnam.

There have been many studies of internal migration in Vietnam (Guest 1998; Djamba, 1999; Dang et al., 1997; Dang, 2001; Dang et al., 2003; GSO and UNFPA, 2005; Cu, 2005; Dang and Nguyen, 2006; Nguyen et al., 2008; Tu et al., 2008; Phan, 2012; Nguyen et al., 2015). However, the Vietnamese economy continues to grow and develop apace, and the domestic labor market is one of the key conduits for structural change. From 2005 to 2013, urban employment in Vietnam grew by 45%, rising from about one quarter of jobs to nearly one-third. Meanwhile, rural employment expanded by only 14% (data from gso.gov.vn, accessed 5 July 2015). Foreign investment, much of which goes into labor-intensive manufacturing enterprises located in urban and periurban industrial zones, surged after Vietnam's WTO accession in 2007. Moreover, government policies affecting labor demand and supply, including migration decisions, have also evolved; in particular, the previously strong emphasis on the *ho khau* (residence certificate[2]) as a prerequisite for working in cities has diminished considerably. Institutional barriers to migration (for example, land tenure security and access to credit) are also changing, albeit more slowly. Taken together, these trends provide good reason to regularly revisit migration trends and associated labor market developments as new data become available. We have an opportunity to gain perspective through comparisons with findings from earlier studies, and to contribute to the design and evaluation of labor and social policy for the near future.

Our paper fits within a familiar tradition, yet differs from earlier work in several respects. First, we examine factors associated with of different types of migration, including migration for work and non-work purposes, and migration with different choices of location. Second, we use the most recent available data, from the nationally representative 2010 and 2012 VHLSS. The 2012 VHLSS in particular contains a special module on migration, with extensive data on both migrants and sending households. Thus the results of the study will help identify factors influencing migrating decisions at national as well as regional level.

The rest of the paper is structured as follows. The next section briefly reviews relevant literature. Section 3 discusses data used in this study. Section 4 presents migration patterns in Vietnam. Sections 5and 6 present the estimation method and empirical results of determinants of migration, respectively. The final section concludes the analysis.

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[2] Imported from China, this system was implemented from 1955 in urban areas and nationwide from 1960. Each household is given a registration booklet which records the names, sex, date of birth, marital status, occupation, and relationship to household head for all household members. In principle, no one can have his or her name listed in more than one household registration booklet. The *ho khau* is intended to be tied to place of residence and to provide access to social services such as housing, schooling and health care in that location. As in China, changing one's registered location is a difficult and time-consuming process.

2. Migration choices: a review of literature

Traditional migration models link migration decisions with "pull" and "push" factors. Pull factors are destination-specific incentives such as job opportunities and higher real wages. Push factors at the place of origin cause outmigration. This "disequilibrium" view of migration emphasizes persistent expected income differentials as a major motivation for migration. The New Economics of Labor Migration (Stark and Bloom, 1985) broadens this approach by regarding migration decisions as household-level resource allocation decisions, taken so as to maximize household utility and minimize variability in household income. Recent research tries to identify factors behind migration, taking into account market failures due to information asymmetries, credit market imperfections and network effects.

There are two top-level approaches to estimation of migration propensity: descriptive (based on an *ex post* model such as the gravity equation) and behavioral (e.g. based on an ex *ante* model such as utility maximization). Though the two are not mutually exclusive, most empirical migration models start from either one or the other. Behavioral models make use of microdata such as surveys of individuals or households, while gravity models appeal to the representative agent assumption and make use of aggregate data, for example census data in which migration rates are measured at the level of the community or administrative unit (Phan and Coxhead, 2010; Etzo, 2010; Huynh and Walter, 2012).

The *ex-ante* approach typically starts from a utility function, and derives an estimating model that measures propensity to migrate. In the case of household decisions, migration can be seen as a portfolio diversification strategy—for example, as a response to uninsurable risk in farming. In these models the migrant must implicitly be considered as a continuing household member, at least for the purpose of remittances and/or emergency gifts.[3]

For estimation purposes it is important to recognize that the decisions to migrate and to send remittances are related. In the past it has been conventional to study these in isolation, but recent advances in thinking about remittance behavior (surveyed in Rapoport and Docquier 2006) make it clear that there are risks in assuming that the two are independent. Migrants are non-randomly selected from the population of those eligible to migrate, and their motives for moving, along with other characteristics more commonly included in analyses of the migration decision, are important (McKenzie et al. 2010; Gibson et al. 2011). If the same motivations that explain the decision to move also explain remittance behavior, there is an omitted variable problem, and unless

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[3]Of course, any fully-articulated model of household decision-making must also come to terms with intra-household bargaining and distribution, whether by assuming it to take a specific structure or by modeling it directly.

this is resolved we don't know whether it is migration *per se* that changes outcomes for the family left behind, or some other underlying cause.[4]

The literature on impacts of remittances has traditionally relied on an instrumental variable (IV) approach to deal with the selection issue, but the set of candidate instruments (such as historical outmigration rates, or job opportunities in destinations) is limited (for a survey see Antman, 2012). More recently still, a growing number of empirical papers provide estimation strategies and results in support of a two-stage or integrated approach to estimation of the migration decision and the decision to send remittances (Garip 2012).

The simplest migration model at the micro level specifies a binary variable (migrate or not) as a function of a set of regressors capturing incentives and constraints to labor mobility. In this approach, migration choice is usually modeled by a logistic regression, either a probit or a logit model. At the macroeconomic level, migration is correctly treated as a resource allocation problem (Sjaastad 1962). People move for work because they calculate that the additional returns to doing so outweigh the additional costs. Households (when these are the decision-making units) accept the loss of a productive worker at home in return for the expectation of a flow of remittances that will more than compensate the loss.

In Vietnam, previous studies indicate that migration is a key response of households and individuals to both economic opportunities and livelihood difficulties. A popular strand of research on the determinants of migration is to use the macro gravity model. Dang et. al. (1997) used 1989 census data and found that not surprisingly, more highly developed provinces attracted higher volumes of migrants, other things being equal while the government's organized population movements appeared unsuccessful. Phan and Coxhead (2010) used data from the 1989 and 1999 Censuses to investigate migration patterns and determinants and the role of migration on cross-province income differentials. They found that provinces with higher per capita income attract more migrants. However, the coefficient of income in the sending province was also positive and significant, implying that the "liquidity constraint effect" outweighed the "push" effect in inhibiting migration in poorer regions.

Nguyen and McPeak (2010) used a macro gravity model to study the determinants of inter-provincial migration using annual survey data on population released by the General Statistics Office of Vietnam. The authors included urban unemployment rates and policy relevant variables in their model. They found that migration is influenced primarily by the cost of moving, expected income differentials, disparities in the quality of public services, and demographic differences in characteristics between source and destination areas.

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[4]In fact, as Gibson et al (2013) have pointed out, there are multiple selection problems: self-selection into migration; the decision of an entire household to move or to leave some members behind; migrants' decisions to return home, and the timing of migration decisions.

Several other authors have applied micro approaches to assess drivers of migration. Nguyen et al. (2008) used panel data of households in 2002 and 2004 to explore factors associated with outmigration both for "economic" and "non-economic" reasons, and comparing short and long term migration. They applied a probit model and found that migration is strongly affected by household and commune characteristics. Larger households, and households with a high proportion of working members tend to have more migrants. Higher education attainments of household members also increased the probability of migration. They found evidence of a 'migration hump' for long-term economic migration; that is, the probability of migration has an inverse U shape with respect to per capita expenditures. The presence of non-farm employment opportunities lowered short-term migration, but not long-term movements. Their core regression analysis, however, did not test for ethnicity-based differences in migration rates.

Tuet. al. (2008) examined impacts of distance, wages and social networks on migrants' decisions. They modeled the migration decision as a function of choice attributes and individual characteristics. Choice attributes include wages in destination areas, transport between origin and destination, migrants' social networks, farm prices and local job opportunities. Individual-specific factors include age, education, gender, marital status, and the shares of children and elders in the household. They find that wages and network have significantly positive effects on migration choices, while distance affects them negatively.

Phan (2012) developed an agricultural household model to determine whether credit constraints are a motivation or a deterrent to migration. Using survey data from four provinces, she found that for households with high demand for agricultural investments and high net migration returns, migration is used as a way to finance capital investments.

Fukase (2013) investigated the influence of employment opportunities created by foreign-owned firms on internal migration and destination choices. The author used both the Vietnam Migration Survey 2004 and VHLSS 2004, and used multinomial logit and conditional logit models. This paper found that the migration response to foreign job opportunities is larger for female workers than male workers; there appears to be intermediate selection in terms of educational attainment; and migrating individuals on average tend to go to destinations with higher foreign employment opportunities, even after controlling for income differentials, land differentials, and distances between sending and receiving areas.

Niimi et al. (2009) look at the determinants of remittances instead of migration. They find that migrants send remittances to their original households as an insurance method to cope with economic uncertainty. Remittances are more likely to be sent by high education migrants in big cities such as Hanoi and Ho Chi Minh cities.

Recently, Nguyen et al. (2015) use data from several rounds of a three-province survey in Central Vietnam and find that households are more likely to move from rural to urban areas when exposed to agricultural and economic shocks. However, the probability of migration decreases with the employment opportunity in the village.

3. Data

3.1. *All migration*

This study relies on the VHLSS rounds of 2010 and 2012, conducted by the General Statistics Office (GSO) with technical support from the World Bank in Vietnam. The most widely accessed forms of these surveys contain detailed information on individuals, households and communes, collected from 9,402 households nationwide. Individual data include demographics, education, employment, health, and migration. Household data are on durables, assets, production, income and expenditures, and participation in government programs.

The 2012 VHLSS contained a special module on migration. Respondents were asked about all former members who had departed the household. The module defined former household members as (i) those who had left the household for 10 years or more; (ii) those who had left the household for less than 10 years but were still considered as "important" to the household in terms of either filial responsibility or financial contributions.

Certainly, not all those former household members can be considered to be migrants. Some people leave or separate from their households, for example due to marriage or separation, and continue to live nearby. Therefore, we define migrants as living in a different province from the household. Inter-provincial migration is more costly than within-province migration.[5] We also exclude migrants who left the household more than 10 years prior to the 2012 survey, as the time lapse is too long to be useful. There can be large measurement errors in data of pre-migration variables of migrants, since respondents' memories grow increasingly faulty. We also exclude migrants reported as having left home when they were younger than 15.

Another set of questions asks about the migration experience of household members. A household member is considered as having migration experience if that person was absent from the household for purpose of employment for at least 6 months during the past 10 years. This group basically includes two types: (i) migrants who still visit their origin households, and (ii) migrants who have left the household permanently. The total number of individual observations is 26,015, of

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[5] There are 63 provinces and cities in Vietnam. The average area of a province or city is around 50 km^2. As a result, workers do not need to migrate if they are working within a province or a city.

which 1,974 are considered as migrants. These, however, may have moved away at any time 1-10 years prior to the 2012 survey.

3.2. Recent migrants

To model recent migration, we take advantage of a panel data link between adjacent rounds of the VHLSS, and we use the so-called "large sample VHLSS", which covers an additional 37,000 households in addition to the 9,402 in the small sample.[6] The 2010 and 2012 VHLSS contain a panel that covers 21,052 households. In this panel data there are 5,075 household members who were present in the 2010 VHLSS but not in 2012. Of these recent migrants, 1,150 (22.7%) were reported as having left for employment elsewhere. Information about this group is especially powerful as they comprise a single migrant cohort. Moreover their decisions are responses to the most recent trends in the Vietnamese economy, as opposed to those of the full sample, who have made their decisions at different points over a decade-long interval. We expect less heterogeneity within the recent migrant group, and also more accurate information about them from respondents. There is also less time in which their characteristics might change (for example acquire more education), a problem which may afflict reporting on the longer-term migrants described above.

For consistency with the previous definition, we define migrants as those aged 15 to 59 who moved across provincial boundaries. In the 2010-2012 VHLSS panel, data on whether individuals moved across provinces are collected for only migrants reported as having moved for employment. For individuals who left their households for other reasons such as marriage or separation, there are no data on the destination. We cannot know whether these individuals moved within or between provinces. Thus, we will focus on recent migration for the purpose of work only. The total number of individuals used for this analysis is 54,898, of which 953 are defined as migrants for employment.

4. Migration patterns in Vietnam

Figure 1 shows the purposes and the destination of migrants as reported in the migration module of VHLSS 2012. More than half of migrants moved for employment purposes. Marriage is the second reason, accounting for 21%, followed by study (13%) and all other purposes (11%). In this paper we will focus on work migration. However we also examine pattern and determinants of non-work migration. Although non-work migration is not determined by economic motives, it does help household improve welfare of the migrant-sending household (Nguyen et al., 2011).

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[6] There are no data on expenditure for the 37,000 "large sample" households, but other information is as collected in the small sample.

Figure 1: All migrants: migration reasons and destinations

Reasons for migration   Destinations of migration
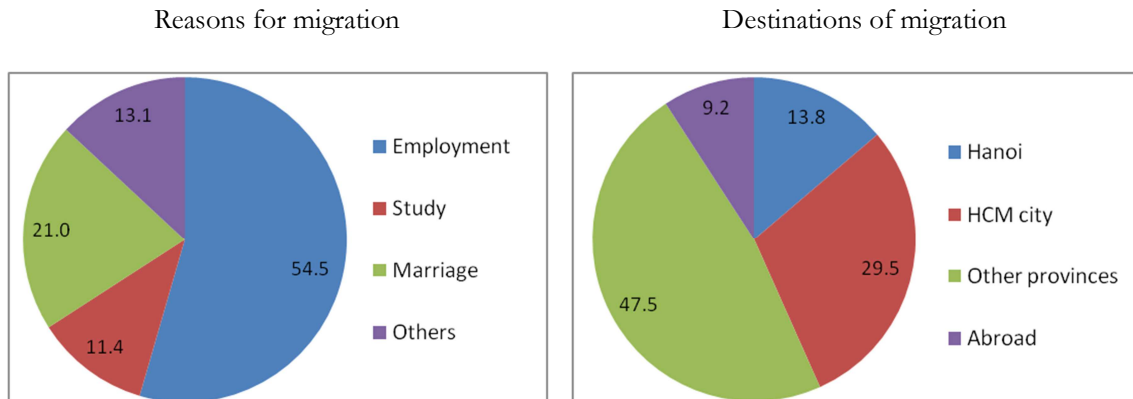
Source: Authors' estimation from VHLSS 2012

The cost and benefit of migration are different by destination. International migration and migration to big cities have high cost but can result in high benefit for both migrants and their households in original areas. According to the 2012 VHLSS, about 9% are international migrants. Of the rest about 42% moved to the two biggest cities in Vietnam (Ho Chi Minh City and Hanoi), and 48% to other internal destinations. The destination of recent work migration in the panel of VHLSS 2010-2012 is similar (Figure 2): of these, 51.8% moved to the two largest cities.

Figure 2: Recent migrants: destination
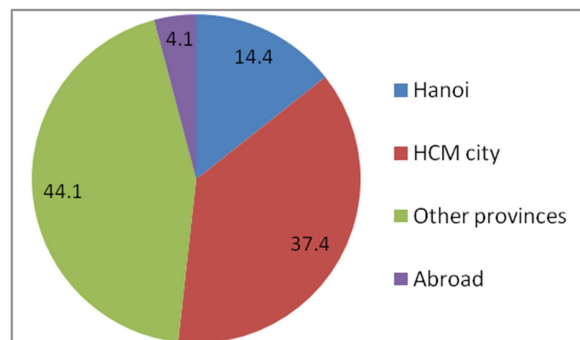
Source: Authors' estimation from VHLSS 2010-2012

Figure 3 shows the age distributions of migrants. Younger people are far more likely to migrate than older people; in both surveys, the modal age of migration is 20 years. Older workers have diminished incentives to move: a shorter payoff period decreases the net gains to migration, thus lowering the probability of migration for older people (Borjas, 2005). They may also have more fixed assets or familial and other constraints inhibiting mobility. All migrants, whether for work or not, are younger on average than non-migrants. Their average age is around 23, 12 years lower than

the average age of non-migrants. Other characteristics of migrants and non-migrants are presented in Appendix Table A.1.

Figure 3: Age distribution of migrants and non-migrants

All migrants (VHLSS 2012)   Recent migrants (VHLSS 2010)
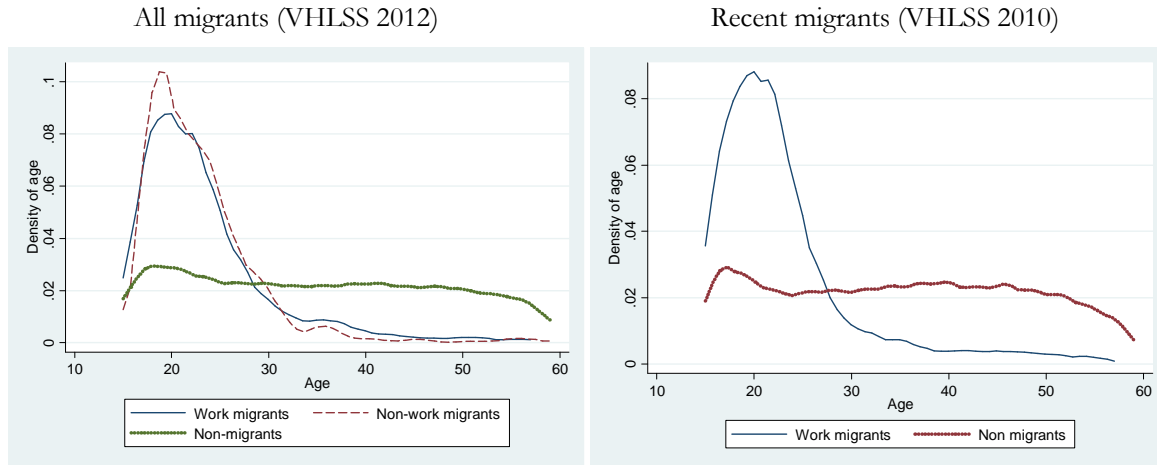
Source: Authors' VHLSS 2010 and 2012

Table 1 shows demographic characteristics of migrants. The proportions of work and non-work migrants from VHLSS 2012 are 4.3% and 3.3% respectively. In the 2010-2012 panel, 1.7% migrated for recently for work. Males have a higher rate of migration for work, but a lower rate for non-work than females. Kinh (ethnic majority) and Hoa (ethnic Chinese) people are more likely to migrate than other ethnic groups. A large proportion of ethnic minorities live in mountainous and remote areas, and have limited information on migration opportunities. Migration costs may also be higher due to long distances to cities. But we shall see in the next section that distance and remoteness alone do not account for differences between Kinh/Hoa and ethnic minority groups.

Table 1: Migration rate by demographic characteristics (%)

	All migration (VHLSS 2012)		Recent work migration (Panel VHLSS 2010-2012)
	Work migration	Non-work migration	
Gender			
Male	4.77	2.32	2.10
Female	3.90	4.28	1.38
Ethnicity			
Kinh, Hoa	4.58	3.63	1.91
Ethnic minorities	2.75	1.35	1.01
Completed education level			
< Primary	3.42	3.75	0.63
Primary	3.38	2.49	1.43
Lower-secondary	4.46	2.05	1.81
Upper-secondary	4.84	3.68	3.69
Technical degree	6.82	4.64	1.68
Post-secondary	3.96	6.40	1.40

	All migration (VHLSS 2012)		Recent work migration (Panel VHLSS 2010-2012)
	Work migration	Non-work migration	
Total	4.33	3.31	1.74

Source: Authors' estimation from VHLSS 2010-2012

Among those who move for work, there appears to be an inverse-U shaped relation between education and migration. People with very low or very high education are less likely to migrate for work than those with middle-level education (i.e. secondary school). This pattern, which is evident both for all migrants and for those moving in the 2010-12 period, is not apparent among non-work migrants. Since education and household wealth are typically correlated, it presumably reflects the same forces that produce an inverse-U shaped relation between wealth and migration: migration rates are typically much higher for middle-income households than for either the very poor, who may lack the means to move, or the very rich, for whom the gains from migration might be relatively small..

By region, people in Central Coast are most likely to migrate, followed by Mekong River Delta (Table 2). People in South East – the richest region – have the lowest migration rate. Much of the Southeast Region is already integrated with the greater Ho Chi Minh City metropolitan area. Urban people also move in Vietnam, but the proportion is higher in rural than urban areas.

Table 2: Migration rate by region of origin (%)

	All migration (VHLSS 2012)		Recent work migration (Panel VHLSS 2010-2012)
	Work migration	Non-work migration	
Region			
Red River Delta	3.40	3.46	1.28
Northern Mountains	3.96	2.05	1.17
Central Coast	7.36	3.79	2.75
Central Highlands	1.95	2.98	1.44
South East	0.91	2.29	0.61
Mekong River Delta	5.55	4.38	2.30
Location			
Rural	5.33	3.50	1.98
Urban	1.93	2.86	1.05
Total	4.33	3.31	1.74

Source: Authors' estimation from VHLSS 2010-2012

Migration clearly responds to changing labor demand in the Vietnamese economy. Unequal growth rates drive up wages in urban areas, and these differentials persist in spite of relatively free movement of labor. Appendix Figure 1 illustrates this using data from the Vietnam Labor Force Survey, a very rich source of data on individual employment and earnings.

Migrants change jobs in ways that reflect the economic structure of destinations. Table 3 shows transition matrices of migrants by skills and occupation. We define the occupation skill level based on VHLSS occupation codes.[7] Even though these data include non-work migrants as well as those moving within or into the labor market, the trends remain clear. In panel (a), the largest off-diagonal transitions are from unskilled jobs or no work (including school) into semi-skilled occupations, which include construction, process and production line work, and many other categories related to the fast-growing urban-industrial economy. Panel (b) shows that two-thirds of new semi-skilled workers in the migrant sample came from either unskilled jobs (28.8%) or from not working (36.9%).

Table 3: Occupation and sector transitions

		Occupation in destination				
Panel (a)		Skilled	Semi-skilled	Unskilled	Not working	Total
	Skilled	82.56	2.71	2.47	12.26	100
Occupation in home	Semi-skilled	1.01	74.25	5.71	19.03	100
	Unskilled	0.91	42.13	42.24	14.71	100
	Not working	13.6	32.49	6.86	47.04	100
	Total	9.93	42.34	16.73	31.01	100

		Occupation in destination				
Panel (b)		Skilled	Semi-skilled	Unskilled	Not working	Total
	Skilled	29.46	0.23	0.52	1.4	3.54
Occupation in home	Semi-skilled	1.98	34.06	6.63	11.92	19.42
	Unskilled	2.66	28.81	73.13	13.74	28.96
	Not working	65.9	36.9	19.72	72.94	48.08
	Total	100	100	100	100	100

		Sector in destination				
Panel (c)		Agriculture	Industry	Service	Not working	Total
	Agriculture	25.59	37.67	22.36	14.38	100
Sector in home	Industry	1.88	68.61	11.89	17.62	100
	Service	2.16	7.16	71.3	19.38	100
	Not working	1.31	25.42	26.23	47.04	100
	Total	8.5	32.6	27.89	31.01	100

		Sector in destination				
Panel (d)		Agriculture	Industry	Service	Not working	Total
	Agriculture	87.16	33.44	23.21	13.42	28.95
Sector in home	Industry	2.82	26.83	5.44	7.24	12.75
	Service	2.6	2.24	26.14	6.39	10.22
	Not working	7.43	37.48	45.22	72.94	48.08
	Total	100	100	100	100	100

Source: computed from VHLSS data.

[7] Skilled occupations include leaders/managers from sectors and organizations, high-level experts, and average-level experts. Semi-skilled occupations include office staff, service and sales staff, skilled laborers in agriculture, forestry, and fisheries, manual laborers and related occupations, machine assembling and operating workers. Other workers are defined as unskilled.

Similarly, two-thirds (65.9%) of new skilled workers were not working prior to migration. These transitions are matched by sectoral changes. In panel (c), only one-fourth (25.6%) of workers in agriculture remain in that sector after migration, whereas 60% transition into industry or services—mainly the former. Former farm workers make up one third (33.4%) of new industry sector jobs taken by migrants (panel (d)).

5. Econometric model

In this section we explore factors associated with the migration decision.

5.1. Logit model

The basic model used in this paper is the logistic regression model. This estimates an individual's likelihood to migrate as a function of individual characteristics, and the characteristics of their household and community. In particular, we have the following form:

$$P(y_{ijk} = 1|X) = F(\alpha + INDIVIDUAL_{ijk}\gamma + HOUSEHOLD_{jk}\delta + COMMUNE_k\theta), \quad (1)$$

Where y_{ijk} is the migration variable of individual i in household j in commune k. This is a binary outcome with 1 corresponding to an individual being a current migrant and 0 otherwise. $INDIVIDUAL_{ijk}$, $HOUSEHOLD_{jk}$, and $COMMUNE_k$ denote vectors of corresponding characteristics. F is the logistic function, which can be expressed as follows:

$$P(y_{ijk} = 1 | X) = \frac{e^{X\beta}}{1 + e^{X\beta}},$$

where $X\beta$ denotes $(\alpha + INDIVIDUAL_{ijk}\gamma + HOUSEHOLD_{jk}\delta + COMMUNE_k\theta)$.

The individual variables include age, gender, ethnicity, and education. Household variables include household composition, characteristics of household head, and household assets including land and claims on pensions and transfers. Characteristics of communes include basic infrastructure, geographic type, and recent record of natural disasters.

5.2. Multinomial logit model

In our study, people are reported as having migrated for both work and non-work purposes. It is not clear to us whether this distinction is meaningful, as undoubtedly many of those who migrate for "non-work" purposes ultimately seek and find employment in their new home. However, the fact that they are reported as leaving for different purposes may itself convey information about differences among individuals. Therefore, to examine the influences over the migration decisions of

different individuals, we will use a multinomial logit model. In this model, individuals have three mutually exclusive choices: migrate for work; migrate not work work, and not migrate. In the mutinomial logit model, the outcome variable y is not binary, but discrete. y is equal to 1, 2 and 3 if an individual selects 'migrate for work', 'migrate for non-work and 'not migrate', respectively. The multinomial logit model is as follows:

$$P(y=1|X) = \frac{e^{X\beta_1}}{1+\left(e^{X\beta_2}+e^{X\beta_3}\right)} \tag{2}$$

$$P(y=2|X) = \frac{e^{X\beta_2}}{1+\left(e^{X\beta_2}+e^{X\beta_3}\right)} \tag{3}$$

$$P(y=3|X) = \frac{1}{1+\left(e^{X\beta_2}+e^{X\beta_3}\right)}, \tag{4}$$

in which the third choice, 'not migrate', is the reference category. X is a vector of individual, household and commune characteristics as previously described, and β is a vector of coefficients to be estimated.

The multinomial logit model can be easily extended to more than three choices. In this study we also examine the determinants of migration by destination. Individuals face four mutually exclusive choices: migrate to Hanoi or HCM City; migrate to other provinces, migrate abroad, and stay at home.

Since the logit and multinomial logit functions are not linear, the partial effects of controls on migration vary across the X vector. We will report their marginal effects, which are calculated as the estimated partial derivatives of the logit or multinomial logit functions with respect to X, evaluated at the mean values of X.

Finally, it is important to note that some explanatory variables could be endogenous with respect to the migration decision. If migration is positively selected on education, for example, then some individuals may invest in more education for the purpose of migration. Our estimates will then be inconsistent. Similarly, measures of household wellbeing and assets in the 2012 data may in part reflect remittance incomes from prior migrants. Dealing with this risk is a demanding task in cross-sectional data. The joint use of 2010 with 2012 data helps overcome some (though not all) of these risks.

6. Estimation results

6.1. Work and non-work migration

We first use multinomial logit regressions to examine factors associated with the work and non-work migration decisions of all former household members identified in the 2012 VHLSS migration module. The sample consists of all non-migrants and migrants aged between 15 and 59. Variables are as summarized above (a complete list with summary statistics is in Appendix Tables A.2 and A.3). Note that for migrants, "age" refers to their age at the time of migration.

To capture migration networks, we created a commune-level variable as the ratio of out-migrants to the commune population. The rationale is that a person is more likely to migrate if others in her/his commune have gone ahead. She/he can receive information on migration from other migrants. We also include geographic variables and disaster exposure of communes. However, this information is available only for rural communes.

Table 4: Migration choices by all migrants, VHLSS 2012

Explanatory variables	Multinomial logit: Full sample		Multinomial logit: Rural residents	
	Work migration (yes=1, no=0)	Non-work migration (yes=1, no=0)	Work migration (yes=1, no=0)	Non-work migration (yes=1, no=0)
Female (Y/N)	-0.00057	0.00417***	-0.00046	0.00359***
	(0.00082)	(0.00074)	(0.00113)	(0.00072)
Age	-0.00112***	-0.00068***	-0.00147***	-0.00057***
	(0.00008)	(0.00008)	(0.00012)	(0.00008)
Ethnic minority (Y/N)	-0.00835***	-0.00497***	-0.01150***	-0.00497***
	(0.00144)	(0.00087)	(0.00207)	(0.00101)
Primary	-0.00339**	-0.00316***	-0.00426**	-0.00300***
	(0.00149)	(0.00071)	(0.00210)	(0.00076)
Lower-secondary	-0.00455***	-0.00583***	-0.00566**	-0.00549***
	(0.00156)	(0.00094)	(0.00222)	(0.00105)
Upper-secondary	-0.00634***	-0.00423***	-0.00775***	-0.00358***
	(0.00149)	(0.00077)	(0.00201)	(0.00075)
Technical degree	0.01639***	0.00799***	0.02294***	0.00836***
	(0.00330)	(0.00196)	(0.00515)	(0.00224)
Post-secondary	0.00279	0.00440***	0.00047	0.00416***
	(0.00239)	(0.00154)	(0.00307)	(0.00152)
Urban resident (Y/N)	-0.00936***	-0.00164**		
	(0.00138)	(0.00067)		
Age of HH head	0.00126***	0.00100***	0.00194***	0.00101***
	(0.00034)	(0.00024)	(0.00051)	(0.00026)
Age squared of HH head	-0.00001***	-0.00001***	-0.00001***	-0.00001***
	(0.00000)	(0.00000)	(0.00000)	(0.00000)
Head is female (Y/N)	0.00560***	0.00252***	0.00844***	0.00380***
	(0.00179)	(0.00087)	(0.00287)	(0.00112)
HH head education (years)	0.00039**	0.00007	0.00062**	0.00007
	(0.00018)	(0.00009)	(0.00026)	(0.00009)
Proportion of children in HH	-0.04580***	-0.02827***	-0.06074***	-0.02648***
	(0.00509)	(0.00421)	(0.00708)	(0.00467)
Proportion of elderly in HH	0.00362	0.00271	0.00503	0.00229

Explanatory variables	Multinomial logit: Full sample		Multinomial logit: Rural residents	
	Work migration (yes=1, no=0)	Non-work migration (yes=1, no=0)	Work migration (yes=1, no=0)	Non-work migration (yes=1, no=0)
	(0.00392)	(0.00217)	(0.00553)	(0.00213)
HH size	0.00400***	0.00215***	0.00567***	0.00212***
	(0.00049)	(0.00036)	(0.00071)	(0.00041)
HH member migrated (Y=1, N=0)	0.00052	-0.00102*	-0.00118	-0.00147***
	(0.00117)	(0.00053)	(0.00154)	(0.00052)
HH has agric. land (Y/N)	0.02706***	0.00830***	0.02298***	0.00552***
	(0.00514)	(0.00237)	(0.00337)	(0.00149)
HH has ag. land*Log of land area	-0.00385***	-0.00127***	-0.00524***	-0.00117***
	(0.00063)	(0.00034)	(0.00088)	(0.00036)
House is permanent structure (Y/N)	-0.00261**	-0.00234***	-0.00340*	-0.00228***
	(0.00128)	(0.00069)	(0.00179)	(0.00066)
HH has nonfarm income (Y/N)	-0.02784***	-0.01264***	-0.03290***	-0.01070***
	(0.00433)	(0.00267)	(0.00501)	(0.00253)
HH receives social transfers/pension (Y/N)	-0.00128	-0.00069	-0.00249	-0.00066
	(0.00124)	(0.00060)	(0.00176)	(0.00059)
Ratio of migrants in commune			0.00072**	0.00010
			(0.00032)	(0.00014)
Distance to nearest town (km)			0.00435	0.00132
			(0.00663)	(0.00248)
Commune in mountainous area			0.00498**	-0.00121
			(0.00243)	(0.00082)
Commune has all-season road Y/N			0.00399*	0.00073
			(0.00204)	(0.00071)
Commune has market Y/N			-0.00588***	-0.00130**
			(0.00158)	(0.00059)
Regional dummies	Yes		Yes	
Observations	26,015		18,657	
R2	0.331		0.303	

Standard errors in parentheses. Standard errors are corrected for sampling weight and within-cluster correlation.
*** p<0.01, ** p<0.05, * p<0.1
Notes: Excluded category is No Migration. Education reference category is No Education.
Source: Authors' estimation from VHLSS 2012.

Table 4 presents marginal effects from the multinomial logit of migration choices.[8] Since an individual is faced with three mutually exclusive choices, the sum of marginal effects of the three choices is equal to 0. Therefore, we do not report estimates for the non-migration choice. We do, however, report estimates separately for all migrants, and for the subsample of those from rural households.

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[8] Many studies using multinomial logit models report tests for the independence of irrelevant alternatives (IIA). We conducted Hausmann and Small-Hsiao tests, and both rejected the null hypothesis that IIA holds. However, Monte Carlo studies indicate that these tests are biased toward rejection (Cheng and Long 2007). *Ex ante*, the choices faced in our model seem "plausibly… distinct and weighed independently in the eyes of each decision-maker" (McFadden 1974). *Ex post,* estimates using logit models applied separately to each choice yield marginal effects that are very similar to those obtained in the multinomial logit model (results available on request).

Most coefficient estimates are of expected signs. Men are more likely than women to migrate for work, but less likely to migrate for non-work. The likelihood of migration diminishes with age.[9] Ethnic minority people are much less likely to migrate than the Kinh or Hoa.

Regarding education, typically we find that migration is positively selected, which implies a higher propensity to move with each level of education attained (since "no education" is the reference category). The results in Table 4 strongly confirm the positive selection hypothesis for post-secondary technical qualifications, but other post-secondary credentials are insignificant for migrants seeking work, and primary and secondary school attainment is *negatively* associated with migration. Possibly, people with post-secondary education are likely to report "study" as their reason for migration. They might migrate to cities for education first, and then stay to work there after completion of post-secondary education. In addition, the estimate of education can be biased, since omitted variables such as ability can be correlated with education.

Household characteristics play an important role in migration decisions. People living in a household with female heads are more likely to migrate. Age of household head has an inverted-U shape relation with the probability of work migration of household members. As the age of the head increases, the probability of household members migrating for work tends to increase. However, after a peak of around 67 years old, this probability tends to decrease. The relation between the age of household head and non-work migration also follows an inverted-U shape relation, but this age peak is around 14. It means that the probability of non-work migration of members mainly decreases as the age of household head increases. The education (in years) of household heads is promotes migration for work, but not for non-work purposes.

Household composition also matters for migration decisions. Migrants are more likely to come from larger households, but less likely to move from households with a large proportion of dependent children. The age dependency rate seems to have no influence. Having a migrant already in the household reduces the chance of migration of other household members. This is because the cost of migration is higher for the remaining household members. For example, if a father already migrated, a mother should stay to take care of children and other dependent members.

Wealthier households—those with better housing, non-farm income and larger farm land area—are less likely send their members to migrate for work as well as non-work purposes. Farm households (having crop land) tend to send their members for work migration, presumably to diversify income. However, conditional on having some land, households with larger farm areas send out fewer migrants. A larger farm implies higher agricultural labor productivity. As a result, people having larger farms are less likely to migrate.

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[9] A quadratic term in age was included in earlier versions, but was insignificant and subsequently dropped.

We have suppressed full coefficient estimates for regions to save space. These show, however, that populations in the Central Coast, the Northern Mountains and the Mekong River Delta are more likely to migrate than in the Red River Delta or the South East Region, the two regions closest to Vietnam's large cities.

For rual areas, we also examine the effect of community on migration via commune variables. Most of these are not significant. Only people living in mountains and in villages without daily markets tend to migrate at higher rates.[10]

6.2. Choice of destination

Table 5 reports estimates of the choice of migrant destination using a multinomial logit model. As noted above, we use four destination choices: Hanoi or Ho Chi Minh City; other provinces; migrating abroad, and the reference category, not migrating. Once again, we do not report reference category results since these are simply the negative of the sum of the other three.

Table 5: Migration destination choices by all migrants, VHLSS 2012

Explanatory variables	Multinomial logit: Full sample		
	Migration to Hanoi or HCM City	Migration to other provinces	International Migration
Female (Y/N)	0.00094**	0.00093*	0.00072
	(0.00046)	(0.00050)	(0.00056)
Age	-0.00061***	-0.00065***	-0.00020***
	(0.00007)	(0.00007)	(0.00003)
Ethnic minority (Y/N)	-0.00480***	-0.00397***	-0.00328***
	(0.00088)	(0.00084)	(0.00069)
Primary	-0.00290***	-0.00235***	0.00019
	(0.00084)	(0.00078)	(0.00131)
Lower-secondary	-0.00420***	-0.00465***	0.00063
	(0.00102)	(0.00087)	(0.00130)
Upper-secondary	-0.00376***	-0.00450***	0.00003
	(0.00093)	(0.00081)	(0.00124)
Technical degree	0.00787***	0.01108***	0.00332**
	(0.00203)	(0.00246)	(0.00154)
Post-secondary	0.00472**	0.00262*	-0.00063
	(0.00230)	(0.00134)	(0.00132)
Urban resident (Y/N)	-0.00339***	-0.00447***	-0.00053
	(0.00075)	(0.00081)	(0.00084)
Age of HH head	0.00077***	0.00098***	0.00021
	(0.00025)	(0.00023)	(0.00016)
Age squared of HH head	-0.00001***	-0.00001***	-0.00000
	(0.00000)	(0.00000)	(0.00000)
HH Head is female (Y/N)	0.00281***	0.00241**	0.00264**
	(0.00090)	(0.00104)	(0.00125)
HH head education (years)	0.00022**	0.00013	0.00017
	(0.00010)	(0.00011)	(0.00011)
Proportion of children in HH	-0.02232***	-0.02873***	-0.00746***
	(0.00419)	(0.00369)	(0.00230)
Proportion of elderly in HH	0.00272	0.00086	0.00393*
	(0.00216)	(0.00223)	(0.00234)
HH size	0.00176***	0.00211***	0.00127***
	(0.00039)	(0.00029)	(0.00024)

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[10] In other runs we included variables recording frequency of flood, storms and droughts in the commune. However these were insignificant in the cross-section estimates and were dropped.

Explanatory variables	Multinomial logit: Full sample		
	Migration to Hanoi or HCM City	Migration to other provinces	International Migration
HH member migrated (Y=1, N=0)	-0.00005	-0.00071	-0.00006
	(0.00061)	(0.00058)	(0.00059)
HH has agric. land (Y/N)	0.01118***	0.01489***	0.00360
	(0.00307)	(0.00342)	(0.00222)
HH has ag. land*Log of land area	-0.00157***	-0.00203***	-0.00043
	(0.00040)	(0.00040)	(0.00031)
House is permanent structure (Y/N)	-0.00106	-0.00304***	0.00088
	(0.00067)	(0.00072)	(0.00084)
HH has nonfarm income (Y/N)	-0.01136***	-0.01691***	-0.00687***
	(0.00239)	(0.00304)	(0.00226)
HH receives social transfers/pension (Y/N)	-0.00062	-0.00064	-0.00110
	(0.00058)	(0.00071)	(0.00068)
Regional dummies	Yes	Yes	Yes
Observations		25,774	
R2		0.270	

Standard errors in parentheses. Standard errors are corrected for sampling weight and within-cluster correlation.
*** p<0.01, ** p<0.05, * p<0.1
Notes: Excluded category is No Migration. Education reference category is No Education.
Source: Authors' estimation from VHLSS 2012.

Age, gender and ethnicity have similar effects on migration decisions, whether to Hanoi/HCM City or to other provinces. There are minor differences between these and international migration, and to foreign countries. It should be noted that international migration is mainly in the form of labor exports to other countries such as Taiwan and Malaysia (e.g., see Labor Newspaper, 2008; Nguyen and Mont, 2010). These laborers find mainly semi-skilled occupations, for example as process workers in factories and farms.

Household variables are more important in internal than international migration decisions. Households with farmland are more likely to migrate internally. However, conditional on having land, a greater area tends to reduce the probability of migration, as already seen in Table 4. Other measures of household wealth also discourage internal, but not international, migration.

Geographically, those in the landlocked Central Highlands are much less likely to choose international migration. People from urban areas are less likely to migrate internally than those from rural areas. However, there is no difference between urban and rural areas in the probability to move internationally.

6.3. Recent migrants

The analysis of the preceding section refers to all migrants who moved between 2002 and 2012. In this section, we focus only on the "extensive margin" of recent migrants, using the combined 2010-2012 data. Decisions made by these migrants can be expected to reflect the most recent information available about labor market conditions and opportunities, which evolve along with the Vietnamese economy.

Table 6 reports marginal effect estimates from logit regressions on propensity to migrate. It also reports multinomial logit estimates of the destination choices of migrants (non-migration is the reference category, not reported in the table).

Table 6: Migration choices by post-2010 migrants for work, VHLSS 2010 and 2012

Explanatory variables	Logit: full sample	Logit: rural sample	Multinomial Logit: Full sample	
	Migration for work since 2010	Migration for work since 2010	Migration to Hanoi, HCM city and abroad	Migration to other provinces
Female (Y/N)	-0.00145***	-0.00189***	-0.00071***	-0.00129***
	(0.00041)	(0.00053)	(0.00026)	(0.00040)
Age	0.00059***	0.00086***	0.00048***	0.00032**
	(0.00014)	(0.00018)	(0.00009)	(0.00014)
Age squared	-0.00001***	-0.00002***	-0.00001***	-0.00001***
	(0.00000)	(0.00000)	(0.00000)	(0.00000)
Ethnic minority (Y/N)	-0.00244***	-0.00332***	-0.00203***	-0.00022
	(0.00082)	(0.00110)	(0.00053)	(0.00082)
Single	0.01043***	0.01369***	0.00673***	0.00647***
	(0.00169)	(0.00233)	(0.00131)	(0.00155)
Primary	0.00252**	0.00311**	0.00152*	0.00078
	(0.00112)	(0.00136)	(0.00079)	(0.00094)
Lower-secondary	0.00154	0.00217*	0.00110	0.00071
	(0.00103)	(0.00128)	(0.00074)	(0.00092)
Upper-secondary	0.00426***	0.00467**	0.00304**	0.00272**
	(0.00156)	(0.00192)	(0.00119)	(0.00138)
Technical degree	0.00420**	0.00567**	0.00232*	0.00537**
	(0.00191)	(0.00266)	(0.00127)	(0.00221)
Post-secondary	0.00281	0.00361	0.00198	0.00444**
	(0.00181)	(0.00259)	(0.00131)	(0.00219)
Urban resident (Y/N)	-0.00318***		-0.00171***	-0.00285***
	(0.00081)		(0.00048)	(0.00071)
Age of HH head	0.00080***	0.00087***	0.00029**	0.00064***
	(0.00020)	(0.00026)	(0.00012)	(0.00018)
Age squared of HH head	-0.00001***	-0.00001***	-0.00000**	-0.00001***
	(0.00000)	(0.00000)	(0.00000)	(0.00000)
HH Head is female (Y/N)	0.00101	0.00109	0.00049	0.00089
	(0.00067)	(0.00092)	(0.00042)	(0.00059)
HH head education (years)	0.00005	0.00004	0.00003	0.00005
	(0.00008)	(0.00011)	(0.00005)	(0.00007)
Proportion of children in HH	-0.00222	-0.00265	-0.00075	-0.00179
	(0.00206)	(0.00277)	(0.00126)	(0.00177)
Proportion of elderly in HH	0.00017	-0.00160	0.00105	-0.00055
	(0.00196)	(0.00254)	(0.00118)	(0.00194)
HH size	0.00049***	0.00067***	0.00019*	0.00034**
	(0.00019)	(0.00025)	(0.00010)	(0.00015)
HH member migrated (Y/N)	0.00490***	0.00533***	0.00305***	0.00155*
	(0.00112)	(0.00133)	(0.00077)	(0.00079)
HH has agric. land Y/N)	0.00500***	0.00439***	0.00123	0.00412**
	(0.00181)	(0.00170)	(0.00121)	(0.00163)
HH has agric. land*Log of land area	-0.00059**	-0.00064**	-0.00017	-0.00054**
	(0.00024)	(0.00031)	(0.00016)	(0.00021)
House is permanent structure (Y/N)	-0.00156***	-0.00170***	-0.00065**	-0.00145***
	(0.00051)	(0.00064)	(0.00032)	(0.00049)
HH has nonfarm income (Y/N)	0.00033	0.00030	0.00023	0.00046
	(0.00057)	(0.00065)	(0.00037)	(0.00052)
HH receives social transfers/pension Y/N)	0.00048	0.00099	0.00020	0.00004
	(0.00074)	(0.00101)	(0.00046)	(0.00063)
Ratio of migrants in commune		0.02086***		
		(0.00745)		
Commune in mountainous area		0.00301**		
		(0.00133)		

Explanatory variables	Logit: full sample	Logit: rural sample	Multinomial Logit: Full sample	
	Migration for work since 2010	Migration for work since 2010	Migration to Hanoi, HCM city and abroad	Migration to other provinces
Commune had drought in the past 3 years		0.00322*** (0.00090)		
Regional dummies	Yes		Yes	
Observations	54,898		40,568	
R2	0.186		0.170	

Standard errors in parentheses. Standard errors are corrected for sampling weight and within-cluster correlation.
*** p<0.01, ** p<0.05, * p<0.1
Notes: Excluded category is No Migration. Education reference category is No Education.
Source: Authors' estimation from VHLSS 2012.

For the migration propensity regressions we used two samples. The first uses all adults aged 15 to 59 in both urban and rural areas. In this sample, there are no commune variables, since there are no commune-level data for urban areas in the VHLSS. The second sample uses only adults from rural areas, and includes commune data among the explanatory variables. The data differ in one other way: unlike VHLSS 2012, the 2010 data indicate whether an individual is single (never married) or not. As might be expected, this is a powerful predictor of migration choices.

Among the recent migrant group males, Kinh/Hoa, and single people are more likely to migrate for work than females, ethnic minorities and married (including separated, divorced, widowed). Residents of urban areas are also less likely to move. The relation between age and migration is an inverse-U. As age increases, the probability of migration increases. However, after the peak age, estimated at around 19, the probability of migration decreases.

In a strong contrast with the previous results, migration among recent movers is consistently and for the most part significantly positively selected on education (the results for migrants whose education ends with middle school (lower secondary) narrowly miss conventional significance levels, with $p<0.136$). Positive selection is consistent with findings from many other empirical studies in the developing world. However, recent work with Labor Force Survey data suggests that in Vietnam, as in other labor-abundant industrializing economies, a job applicant's formal schooling qualifications may matter less to potential employers than other more directly observable characteristics (Coxhead and Shrestha 2015).

Household conditions matter to recent migration decisions. Migration is more likely from large households, though other demographic characteristics of the household are unimportant. Household wealth (land and housing quality) discourage migration as before, but non-farm and unearned incomes have no effect.

Network effects are clearly seen to be important among recent migrants. Individuals are significantly more likely to move from households with previous migrants, and (in rural areas) from

communes with great outmigration rates. Other commune characteristics are insignificant, except that migration out of mountainous areas is more likely.[11]

The results from the 2010-12 panel are more consistent with expectations than those from the 2012 sample alone. However, even after controlling for household and commune level heterogeneity, the association between ethnic minority status and migration for work remains significantly negative. Members of Vietnam's ethnic minority groups clearly face barriers to mobility that are not accounted for by our explanatory variables. Whether these are supply side (the pull of localized cultural and kinship ties, for example) or demand side (discrimination on the part of potential employers), or a mix of the two, remains to be discovered.

While an exact comparison is infeasible because of variation in data sources and methods, it is nevertheless instructive to compare these results with those from earlier studies. In the 2000s, economic reasons for migration have dominated (this was not the case in the 1990s, when Vietnam was still in the early stages of its transition from command to market economy; see Nguyen et al. 2008). The movement of workers to major urban centers has intensified, and urban-rural discrepancies that underly differences in labor productivity appear not to have narrowed. Importantly, many of the implied policy conclusions from earlier studies remain true a decade or more later, as we discuss in the next section.

7. Conclusions and policy discussion

We have investigated factors influencing internal migration decisions by individuals in households surveyed in the VHLSS, a nationally representative household sample. At individual, household, and community level the results, for the most part, confirm prior findings with respected to determinants of migration decisions. Compared with results from the 2012 VHLSS migration module, which asked about all migrants over a ten-year recall period, our results are stronger and more consistent with priors when we limit ourselves to examining the decisions of migrants who left within a short and recent window, between the 2010 and 2012 VHLSS surveys.

Households treat migration as part of their investment and diversification strategy. Migration is often associated with better human capital at both individual and household level, and with better access to migration networks. Age is very also important for both work and non-work migration. Younger people are more likely to migrate. Gender is important for non-work migration but not work migration. Women are more likely to migrate for non-work purposes than men possibly

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[11] In other specifications, recent drought (in the past three years) was also found to be a significant stimulus to outmigration for work.

women tend to get married and live with husband in other provinces. Members of ethnic minority groups migrate at far lower rates, other things equal, than do their Kinh/Hoa counterparts.

Several "push" factors could be considered as important too. Households with fewer assets, and smaller agricultural land endowments are more likely to send out migrants. Agricultural land fragmentation is a major problem in rural Vietnam (Pham, MacAulay and Marsh 2007). Fragmentation is promoted by aspects of Vietnam's system of land laws, which inhibit land sales or use of land as collateral (Kompas et al. 2009). Our results support the notion that for rural households with very small farms, labor productivity can be significantly improved through out-migration. To some, this finding may suggest that encouraging non-farm economic activities in rural areas will have significant (negative) impact on rural-urban migration. However, Vietnam has a long history of programs intended to subsidize rural development and agricultural productivity growth. It may be time to reevaluate the returns to programs of this kind, which the government itself has acknowledged have had little direct impact (MOLISA 2009). The opportunity cost of spending on rural development is greater investment in well-functioning modern cities; it may well be the case that the marginal social value of spending on improved urban infrastructure, services and amenities exceeds that of continued efforts to persuade rural populations to remain in place.

Our estimates for the most recent migrant cohort confirm that outmigration from rural areas is positively selected on education. Supposing that education is correlated with important capabilities, including entrepreneurial spirit and the potential for innovation, migration may thus reduce the capacity of the sending household or community to produce, be technologically dynamic, and take advantage of entrepreneurial opportunities. This loss of human capital is offset by remittance receipts, of course. If these are used for productive investments they might generate substitutes for the lost labor and skills (Phan, 2012). But increased spending on consumption could even exacerbate losses due to outmigratoin, even as overall household welfare (by conventional measures) rises.

For poor rural communities, there may well be externalities to outmigration by the best and brightest young people. While remittance receipts could produce increased demand for employment in construction, personal services and the like, there is probably lower potential for dynamic growth of the local economy through entrepreneurship. The biggest losers, at a community level, would be those households who have not sent out migrants (and so receive no direct remittance flows) and remain dependent on employment growth in the rural economy. In Vietnam, ethnic minority groups are notable for far lower migration rates than the majority Kinh or Hoa groups. Minority groups live mainly in geographically remote and economically deprived areas and are therefore far less well prepared on almost all counts to participate in the gains from expansion of Vietnam's rapidly-growing industrial and urban economies. Poverty among ethnic minorities remains stubbornly high and widespread, even as it has diminished at quite an extraordinary rate among the population as a

whole (Kozel, 2014). However, our statistical findings confirm the persistence of a large and negative ethnic minority bias in migration rates even after controlling for location and other variables commonly associated with "geographical poverty traps." This bias persists in spite of many years of government programs directed at bringing minority groups into the mainstream of economic life. These programs, we conclude, are either succeeding very slowly or not at all.

Finally, a topic for further research concerns continuing barriers to migration due to the *ho khau* system. In Vietnam the impacts of the *ho khau* remain poorly understood. This is in large part because the main sources of data, including VHLSS, do not collect information on households that are not registered where they actually reside. A very large fraction of recent arrivals to those cities are unregistered. In fact, the number of unregistered people in Hanoi and HCMC is even larger than the number who reported living elsewhere five years previously. In the 2009 census, approximately 350,000 people in Hanoi and 1 million in HCMC reported living in a different province five years previously (World Bank staff estimates based on micro data). Government-provided services for health, schooling, and social protection are tied to the registration system, which restricts or privileges access to those permanently registered. Prior research also found that unregistered migrants paid more for water and electricity in urban areas (Dang, 2006).

Unregistered migrants are less likely to seek professional care when ill and less likely to have health insurance (Haughton, 2010). Likewise there is evidence that lack of registration prevents many poor children from attending school. Although unregistered individuals are concentrated in working ages, the number of unregistered children is not insignificant. Qualitative studies have found that urban schools, which are often overcrowded, give priority to children of residents. Unregistered children and those with temporary residence are sometimes required to pay higher fees to attend public schools, must pay to attend private schools, or do not attend school at all (Oxfam and ActionAid, 2012). Therefore, an important subject for future research is to learn more about the welfare implications of migration among two specific migrant groups: adults or families accompanied by dependent children, and teenaged youth, especially those who truncate their education at home in order to join the urban industrial labor force.

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Appendix tables

<p align="center">Table A.1: Characteristics of migrants and non-migrants</p>

Variables	All migration (VHLSS 2012)			Short-term migration (Panel VHLSS 2010-2012)	
	Work migration	Non-work migration	Non-migrants	Work migration	Non migrants
Individual characteristics					
Female (yes=1, male=0)	0.457	0.656	0.505	0.392	0.509
Age	23.36	22.75	35.26	23.04	34.82
Ethnic minorities (yes=1, Kinh/Hoa=0)	0.088	0.057	0.144	0.099	0.146
Urban (yes=1, rural=0)	0.131	0.253	0.303	0.151	0.287
Number of schooling years	9.465	9.648	8.448	9.514	8.258
Household characteristics					
Household size	4.315	4.554	4.453	4.853	4.537
Having crop land	0.775	0.665	0.622	0.706	0.548
Log of crop land size	6.202	5.400	5.075	6.071	5.059
Solid house	0.253	0.276	0.331	0.275	0.326
Number of observations	1102	872	24041	953	53945

<p align="center">Source: Authors' estimation from VHLSS 2010-2012</p>

Table A.2. Summary of variables used in regressions of all migration (VHLSS 2012)

Variables	Mean	Std. Dev.	Min	Max
Individual and household variables				
Female (female=1, male=0)	0.5076	0.5000	0	1
Age	34.330	12.880	15	59
Ethnic minorities	0.1391	0.3460	0	1
Primary	0.2278	0.4194	0	1
Lower-secondary	0.3140	0.4641	0	1
Upper-secondary	0.2312	0.4216	0	1
Technical degree	0.0987	0.2982	0	1
Post-secondary	0.1017	0.3022	0	1
Age of household head	48.897	11.603	13	97
Head is female	0.2129	0.4094	0	1
Head with Primary	0.2455	0.4304	0	1
Head with Lower-secondary	0.2804	0.4492	0	1
Head with Upper-secondary	0.0926	0.2899	0	1
Head with Technical degree	0.1017	0.3022	0	1
Head with Post-secondary	0.0661	0.2485	0	1
Proportion of children in household	0.1858	0.1888	0	0.8
Proportion of elderly in household	0.0643	0.1319	0	0.75
Pre-migration household size	4.4501	1.5482	1	15
Have a member migrated	0.1626	0.3690	0	1
Have agricultural land	0.6297	0.4829	0	1
Have agricultural land * Log of agricultural land	5.1344	4.0363	0	11.64
Have solid (permanent) house	0.3259	0.4687	0	1
Have non-farm income	0.8652	0.3415	0	1
Receive social assistance, pensions	0.1689	0.3747	0	1
Urban (yes=1, rural=0)	0.2935	0.4554	0	1
Red River Delta	0.2234	0.4165	0	1
Northern Uplands	0.1342	0.3409	0	1
Central Coast	0.2292	0.4203	0	1
Central Highland	0.0550	0.2280	0	1
South East	0.1599	0.3665	0	1
Mekong River Delta	0.1983	0.3988	0	1
Commune variables				
Ratio of migrants in communes	1.1465	1.8433	0	33.33
Distance to nearest town	0.1121	0.1175	0	1.95
Commune in mountain	0.3433	0.4748	0	1
Village has good road	0.8428	0.3640	0	1
Village has a market	0.3153	0.4647	0	1
Commune had storm in the past 3 years	0.1966	0.4337	0	4
Commune had drought in the past 3 years	0.1758	0.4014	0	3
Commune had flood in the past 3 years	0.1788	0.4360	0	4

Source: Authors' estimation from VHLSS 2012

Table A.3. Summary of variables used in regressions of short-term migration (VHLSS 2010-2012)

Variables	Mean	Std. Dev.	Min	Max
Individual and household variables				
Female (female=1, male=0)	0.5072	0.5000	0	1
Age	34.619	12.698	15	59
Ethnic minorities	0.1449	0.3520	0	1
single	0.2998	0.4582	0	1
Primary	0.2319	0.4221	0	1
Lower-secondary	0.2968	0.4569	0	1
Upper-secondary	0.1538	0.3608	0	1
Technical degree	0.0899	0.2860	0	1
Post-secondary	0.0701	0.2554	0	1
Had skilled job in home areas	0.0814	0.2734	0	1
Had semi-skilled job in home areas	0.3300	0.4702	0	1
Not working in home areas	0.1902	0.3924	0	1
Had job in agricultural sector	0.3550	0.4785	0	1
Had job in industrial sector	0.2035	0.4026	0	1
Age of household head	48.070	11.781	16	101
Head is female	0.2084	0.4062	0	1
Head with Primary	0.2526	0.4345	0	1
Head with Lower-secondary	0.2669	0.4423	0	1
Head with Upper-secondary	0.0835	0.2766	0	1
Head with Technical degree	0.1063	0.3082	0	1
Head with Post-secondary	0.0629	0.2427	0	1
Proportion of children in household	0.1955	0.1923	0	0.833
Proportion of elderly in household	0.0527	0.1174	0	0.75
Pre-migration household size	4.5421	1.6076	1	16
Have a member migrated	0.0911	0.2877	0	1
Have agricultural land	0.5505	0.4975	0	1
Have agricultural land * Log of agricultural land	5.0762	4.0574	0	12.65
Have solid (permanent) house	0.3255	0.4686	0	1
Have non-farm income	0.7651	0.4239	0	1
Receive social assistance, pensions	0.1442	0.3513	0	1
Urban (yes=1, rural=0)	0.2847	0.4513	0	1
Red River Delta	0.2305	0.4212	0	1
Northern Uplands	0.1380	0.3449	0	1
Central Coast	0.2220	0.4156	0	1
Central Highland	0.0600	0.2376	0	1
South East	0.1554	0.3623	0	1
Mekong River Delta	0.1940	0.3954	0	1
Commune variables				
Ratio of migrants in communes	0.0105	0.0213	0	1
Distance to nearest town	0.0115	0.0130	0	0.16
Commune in mountain	0.1740	0.3791	0	1
Village has good road	0.8011	0.3992	0	1
Village has a market	0.2881	0.4529	0	1
Commune had storm in the past 3 years	0.1917	0.4419	0	4
Commune had drought in the past 3 years	0.1835	0.4099	0	3
Commune had flood in the past 3 years	0.1749	0.4443	0	4

Source: Authors' estimation from VHLSS 2010
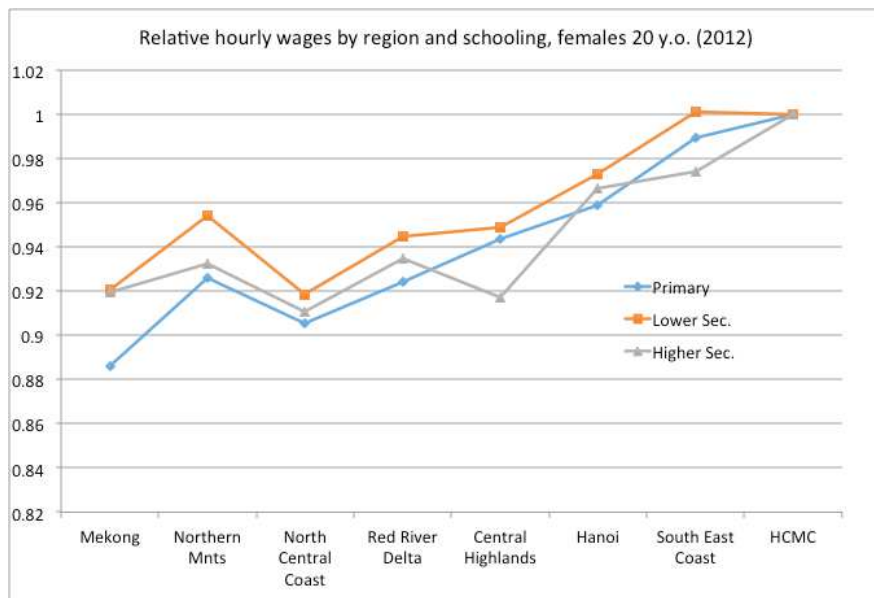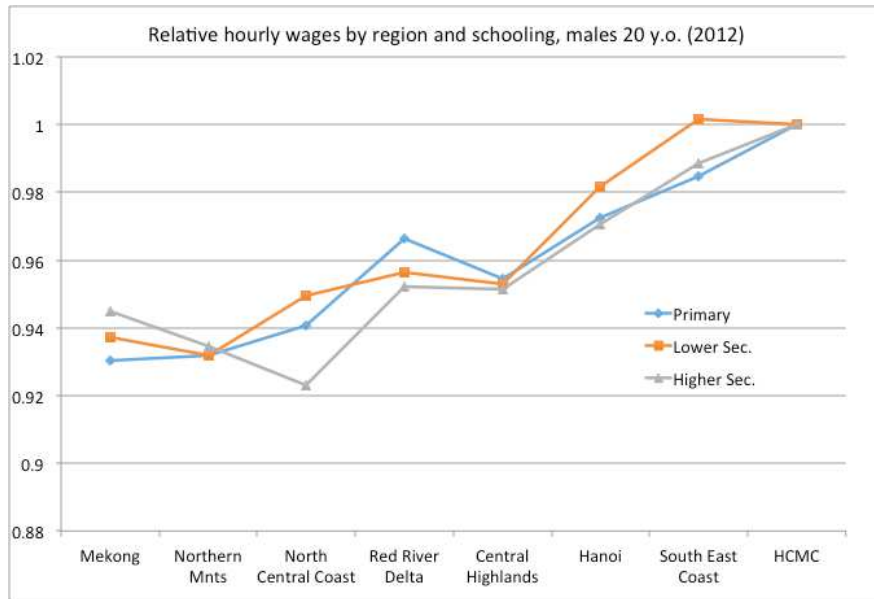
Appendix Figure 1: Relative hourly wages by region and schooling, 2012

Notes: Data points shown are conditional regional means of log wages obtained from Mincer earnings regressions, relative to HCM City. Data for males and females 30 years old are similar, as are differences for vocational training and college (not shown). All regional means are significantly different from corresponding Hanoi mean at p<0.10 or better except: (male, primary): Red River Delta, Central Highlands, SE Coast; (male, higher secondary): Central Highlands; (female, primary): Red River Delta, Central Highlands; (female, lower secondary): Northern Mountains, Central Highlands; (female, higher secondary): SE Coast.

Source: estimated from Labor Force Survey 2012.