Easy Come, Easy Go? Economic Shocks, Labor Migration and the Family Left Behind

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Abstract

This article investigates the impact of negative income shocks in migrant destination countries around the world on the domestic and international labor migration decisions of their family members left behind at origin. Exploiting differences in labor market shocks across and within destinations during the Great Recession, I find large and heterogeneous effects on both types of migration decisions. High remittance-dependent households reduced domestic and increased international labor migration in response to the shock. Low dependence ones remained largely unaffected. I provide a theoretical framework, which rationalizes this heterogeneity by the relative magnitudes of income and substitution effects caused by the shock. The results imply a deterioration in the skill selection of aggregate international migrant flows as high dependence households had below average skill levels. New international migrants targeted the same destinations as established ones from the same household, providing evidence of strong kinship migration networks. The results show that domestic and foreign migration decisions are interrelated and jointly determine aggregate migration flows.

***JEL classification*:** F22, J61, O15, R23

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1 Introduction

Migration has been growing rapidly over the past decades,[1] both within and across countries (The World Bank, 2009), and this trend is expected to continue (IOM/Gallup, 2011). International labor migration typically yields substantial income gains to workers from developing countries (McKenzie et al., 2010) and remittance receipts have become a major source of income for families left behind in the developing world (WorldBank, 2017). In this environment of increasing migration intensity, households at origin become dependent on overseas incomes through remittances and exposed to economic shocks through their migrants abroad. Despite a growing literature on the effects of migration at origin, little is known about how negative income shocks affect households' subsequent migration decisions: do migrant return home when work prospects in their destination of choice deteriorate or do they "diversify" into new destinations? What is the relationship between domestic and international migration? And who selects into which type of migration and return? Answering these questions is important, not only because of development concerns at origin (Clemens, 2011), but also because of the ongoing immigration debate in receiving countries (Hanson and McIntosh, 2016).

Relying on a unique panel of migrant households, this article provides causal evidence on these questions in the context of Vietnam. I exploit a quasi-experiment relying on plausibly exogenous variation in labor market conditions abroad during the Great Recession that had a strong negative effect on migrant incomes and the remittance receipts of their families left behind at the origin. I find that shocks had large and heterogeneous effects on households' domestic and international migration decisions: high remittance-dependent households increased the number of international migrants by 0.17 individuals (i.e. 1 in 6 households sent an additional migrant abroad) in response to the average labor market shock at destination, while decreasing the one of domestic migrants by a similar margin. This finding can be interpreted as a substitution effect between do-

[1] The stock of domestic migrants was estimated to be 763 million in 2005 (Bell and Charles-Edwards, 2013) and 191 million for international migrants, with the latter having increased to 243 million in 2015 (Hongbo, 2015).

mestic and international migration among high remittance-dependent origin households[2] Migrant households with low remittance-dependence remained largely unaffected. These responses were driven by labor migration in particular and new international labor migrants were predominantly females and targeted the US. I find no evidence of changes in the skill selection of new international migrants relative to absent ones from the same household. However, these results imply a deterioration in the skill selection of aggregate international migrant flows as new departures were concentrated among the subgroup of high remittance-dependence which also had lower average skill levels, compared to low dependence ones. I find no evidence of destination switching among established migrants or of a diversification in households' destination portfolios as a reaction to the crisis. The latter is consistent with the presence of strong kinship migration networks. I also find evidence of selective sorting of domestic and international migrants with spouses left behind into return to the origin household which resulted in a reunification of intimate partners. These changes in migration resulted in changes in the demographic composition of affected households and resulted in an increase of the fertility rate at origin by 50%, compared to the baseline mean. These results show that the transmission of negative labor market shocks across countries through migrant remittances can have strong and heterogeneous effects on subsequent migration decisions and result in unexpected demographic changes at origin. The findings have important implications for policy makers and research concerned with the effects of migration in both origin and destination countries.

From a theoretical perspective, labor market shocks in migrant destinations lead to a deterioration of household income at the origin through remittances and create a substitution and income effect for the family left behind. The substitution effect implies that the returns to foreign migration decrease in response to the shock, which makes migration to that destination less attractive. On the other hand, the income effect makes households at origin poorer and, thereby, creates incentives to send more members abroad. The substitution of domestic with international migrants among high remittance-dependent families can thus be rationalized by the relative magnitudes of income and substitution

[2]With respect to the labor literature, this can also be understood as an "added international migrant effect" (Stephens, Jr., 2002).

effects caused by the shock. For highly remittance dependent households, for whom remittances constitute a large share of their consumption, the income effect dominates the substitution effect, leading to a net increase in foreign migration. For low dependence households, in turn, the substitution and income effects should be rather balanced or going the other way, suggesting no or the opposite effect.

Estimating the effects of migration on the family left behind is complicated as selection into migration and return tends to be correlated with unobserved characteristics. In addition, data on migrants and their family members back home tends to be scarce. Following McKenzie and Yang (2012), this study overcomes these issues by adopting a quasi-experimental approach, taking advantage of unique panel survey data from a representative sample of 500 migrant households in Vietnam, which was collected in two waves in 2008 and 2013. The household data is based on individual information from 670 international migrants in 26 destination countries around the world and approximately 2,200 origin household members and domestic migrants. I rely on the fact that families left behind were exposed to unexpected and differential labor market shocks generated by the Great Recession, conditional on the destination choices and pre-migration skill levels of their international migrants. I use this plausibly exogenous source of variation and conduct a difference-in-difference analysis comparing origin households with differential shock exposure, before and after the crisis occurred. The estimation strategy enables me to control for time-invariant characteristics of the household of origin, pre-migration worker characteristics, as well as for aggregate changes in the province of origin over time. This setting allows identifying the causal effects of economic shocks abroad on the outcomes of families left behind at origin. I address a number of potential concerns regarding the empirical approach. Based on recall data from the baseline survey, I replicate my benchmark estimations in a placebo setup as if the Great Recession had happened five years earlier. The results provide evidence of the presence of pretreatment parallel trends for my key outcome variables. Relying on a sample of non-migrant households from the same survey, I also show that labor market shocks abroad did not have any impact at origin other than through households' foreign migrants at the destination.

This study contributes to at least three different strands of the literature in development, labor, and migration: 1) the effects of migration at origin; 2) determinants of migration; and 3) selection into migration. The existing literature dedicated to studying the effects of migration on families left behind is concerned with the multifaceted development impacts that migration unfolds in origin communities.[3] Previous work has focused exclusively on the effects of either domestic or international migration, which can be attributed to the scarcity of household survey data that captures both domestic and international migration. To the best of my knowledge, this study is the first one to show that domestic and foreign migration are interrelated and jointly determine outcomes among families left behind. I find that households make use of both migration strategies for labor motives in a flexible way to cope with income shocks. This finding has important implications for both policy makers concerned with migration in sending countries as well as for migration research in general and calls for a joint analysis of the two types of migration. An additional contribution to this literature is to provide evidence on the effect of migration on households' demographic composition and fertility decisions among families left behind.[4]

The findings in this paper also contribute to the literature on the determinants of migration in general, and those on migration responses to changes in the returns to migration in particular. Most existing work finds a positive elasticity of migration with respect to changes in the returns from migration.[5] Other studies find evidence of contra-

[3]See Antman (2012) for an overview. Outcomes include, for example, education (Edwards and Ureta, 2003; Beine et al., 2008; Antman, 2011, 2006; McKenzie and Rapoport, 2011; Alcaraz et al., 2012; Batista et al., 2011; de Brauw and Giles, 2017), health (Hildebrandt and McKenzie, 2005; Macours and Vakis, 2007; Stillman et al., 2012), labor supply (Amuedo-Dorantes and Pozo, 2006; Lokshin and Glinskayai, 2008; Binzel and Assaad, 2011; Mu and de Walle, 2011; Mendola and Carletto, 2012), or insurance (Rosenzweig and Stark, 1989; De La Brière et al., 2002; Yang and Choi, 2007), while some studies investigate multiple outcomes (Yang, 2008; Gibson et al., 2011; Gröger and Zylberberg, 2016; Gibson, 2015) among families left behind.

[4]See Beine et al. (2013) for a review of this literature. Most existing work has studied the effect of migration on migrant fertility (Hiday, 1978; Hervitz, 1985; Stephen and Bean, 1992; Sato and Yamamoto, 2005; Sato, 2007; Lindstrom and Saucedo, 2007; Guillaume et al., 2018) or the transfer of fertility norms through migration (Fargues, 2007; Blau et al., 2011; Fargues, 2011; Bertoli and Marchetta, 2015).

[5]For example, Hatton and Williamson (1993); Hanson and Spilimbergo (1999); Munshi (2003); Hanson and McIntosh (2012); Hornbeck (2012); Marchiori et al. (2012); Bohra-Mishra et al. (2014); Gröger and Zylberberg (2016); Abarcar (2017); Missirian and Schlenker (2017); Boustan et al. (2017); Baez et al. (2017); Mahajan and Yang (2017); Minale (2018); Kleemans and Magruder (2018) rely on shocks in origin areas that change the returns to migration, while Yang (2006); Wozniak (2010); McKenzie et al. (2014); Bertoli et al. (2017) use destination shocks.

dicting patterns in which increases in the returns to migration lead to lower migration.[6] The results from this paper are consistent with the latter studies in that they imply a negative elasticity of international migration with respect to the returns to migration. I find a strong temporary decrease in the returns from foreign migration due to the Great Recession to cause an *increase* in foreign migration up to three years after the end of the crisis among families left behind.[7] A distinguishing feature of my study is that it allows me to analyze both domestic and international migration within the same household and the results provide novel evidence of a substitution effect between the two types of migration.

The literature on selection into migration typically investigates the observable characteristics of migrants in comparison to the general population at origin or destination.[8] One important dimension of comparison in this literature is migrant human capital as measured by education or skills.[9] The results presented in this study show no effect on the skill selection of international migrants within the household (i.e. new migrants had about the same education level as previous ones), but across households as new migrants left exclusively from the subgroup of high remittance-dependence with below average education levels. Additionally, I find a strong effect on gender selection as additional foreign migration was driven mainly by females. These finding help to better understand migrant selection patterns in the face of negative income shocks at origin and may inform policy-makers interested in predicting the skill levels of new migrant arrivals during times of crisis.

Since skills tend to be positively correlated with income (and negatively with poverty),

[6]See, Halliday (2006); Yang and Choi (2007); Yang (2008); Fajardo et al. (2018).

[7]This finding is also linked to the "added worker effect", which explains how unemployment of one household member may lead to increased labor supply by remaining members (Lundberg, 1985; Stephens, Jr., 2002). Along these lines, the finding in this paper could be interpreted as an "added international migrant effect" among migrant households.

[8]See Greenwood (1985); Borjas (1987); Taylor (1987); Borjas (1991); Stark and Bloom (1985); Chiswick (1999); Beine et al. (2001); Feliciano (2005); Chiquiar and Hanson (2005); Clark et al. (2007); Ibarraran and Lubotsky (2005); Beine et al. (2008); Dolfin and Genicot (2010); McKenzie and Rapoport (2006); Akee (2010); Abramitzky et al. (2012); Ortega and Peri (2013); Bertoli et al. (2013, 2017); Dustmann et al. (2017).

[9]See Docquier and Rapoport (2012) for an overview of this literature and, for example, Fernández-Huertas Moraga (2013) for empirical evidence on domestic and Grogger and Hanson (2011) for international migration.

another branch of the selection literature investigates to which extent household wealth constraints constitute barriers to migration. Most empirical studies are indicative of binding financial constraints, but there is no consensus whether income shocks at origin lead to more or less migration.[10] The findings in this paper contribute to this literature by providing novel evidence that financial constraints among migrant households are not strictly binding, as they achieve to finance (costly) international migration in the face of an income shock. The results suggest two complementary explanations: First, migrant households tend to have superior wealth levels compared to the average household in origin countries (due to positive wealth selection into migration in the first place), which also makes them more able to overcome financial constraints with respect to additional departures (Angelucci et al., 2015). Second, the presence of strong kinship migration networks through established migrants from the same family plays an important role in reducing the fixed costs of migration and facilitate chain migration through family sponsorship (Munshi, 2003).

The remainder of the paper is structured as follows. Section 2 introduces a simple theoretical framework to guide the empirical analysis. Section 3 provides the background and data used. Section 4 outlines the empirical strategy. Section 5 presents the main results and section 6 the robustness checks. I briefly conclude in Section 7.

2 Theoretical Framework

I provide a simple theoretical framework in which migration decisions are determined at the household level (Stark and Bloom, 1985; Borjas, 1991; Chen et al., 2003) and agents choose to send family members away for work in two competing markets: the domestic and the foreign one. The objective of this exercise is to understand how remittance-

[10]Studies with results consistent with binding financial constraints are, for example, Chiquiar and Hanson (2005); Ardington et al. (2009); McKenzie and Rapoport (2006); Bryan et al. (2014); Angelucci et al. (2015); Chernina et al. (2014); De Janvry et al. (2015); Bazzi (2017); Boustan et al. (2017). In contrast, Imbert and Papp (2018) find that an easing of financial constraints in rural India does lead to less domestic migration, which they attribute to the presence of high non-monetary costs from living and working in the city. Mahajan and Yang (2017) find that negative income shocks at origin lead to a positive effect on international migration, which is mediated through the size of existing migration networks between origin and destination.

dependent migrant families left behind revise their migration decisions when they are hit by an economic shock that decreases overseas incomes and, ultimately, leads to a negative income shock at home through remittances. The goal of this section is to provide a framework for guiding the empirical analysis, and not to provide a theoretical contribution as such.

Consider a family consisting of n members. There are three potential locations, the origin area of the household (subscript h for home), the domestic migration destination (subscript d), and the foreign migration destination (subscript f), over which the family can allocate its labor supply. Household members earn wages depending on the location of the job with: $w_h < w_d < w_f$.[11] The economic shock is assumed to depress foreign wages, while domestic ones remain unchanged. Income from the family's labor supply is pooled at the household level[12]. Household utility is determined by a concave function with respect to the number of household members left behind, which has arguments for h, d, and f. Households maximize their utility by keeping as many members as possible at home while allocating labor optimally across domestic and foreign locations in order to secure a minimum level of consumption ($\underline{c}$). The intuition behind this is that securing home production is imperative and requires a minimum number of members at home, but that productivity is marginally decreasing with labor supply (Jayachandran, 2006).[13] Migration incurs constant psychic costs to the household which arise when sending their members away and materialize in the form of disutility (Sjaastad, 1962). This disutility is assumed to be constant over time and smaller for domestic (α) than for foreign migration (β) due to distance and higher ease of return ($\alpha < \beta$). For simplicity, my framework abstracts from (plausibly heterogeneous) monetary migration costs, assuming that wages are net of the respective costs for each location. Normalizing home wages to zero, the

[11]Note that the wage comparison in the context of this study is between the rural areas and domestic migration destinations in Vietnam, a relatively poor developing country, and a range of more developed destination countries as listed in Panel A of Table 1. Gröger and Zylberberg (2016) provide empirical evidence on domestic migrant wages in Vietnam being superior to those in their origin areas, while Clemens et al. (2008) provide evidence on the positive wage premium of international migrants.

[12]This assumption is not restrictive since it suffices for results to hold that only a share of migrant labor income in domestic and foreign destinations is pooled through remittances.

[13]The incentive of keeping family members at home is very prevalent in the Vietnamese context due to the historic household registration system (*Ho Khau*), which conditions property rights and access to social services on the presence of a minimum number of family members in origin areas (Hardy, 2001).

household maximization problem is:

$$\begin{aligned} \underset{m_h, m_d, m_f}{\text{Max}} \quad & U(m_h, m_d, m_f) = u(m_h) - \alpha m_d - \beta m_f, \\ \text{subject to} \quad & m_h + m_d + m_f = n, \\ \text{and} \quad & w_d m_d + w_f m_f \geq \underline{c}. \end{aligned}$$

This setup highlights how the choice of families left behind between keeping the family together and sending members away for work is affected by changes in foreign wages. Securing a certain pay-off from migration corresponds qualitatively to a situation in which falling below $\underline{c}$ puts the family's welfare at risk.[14] The main goal of this simple framework is to illustrate how migrant households with different levels of remittance dependence (i.e. $\frac{w_f}{\underline{c}}$) respond to income shocks in terms of domestic and foreign migration decisions.[15] Solving this model and deriving the elasticities of domestic and foreign migration with respect to foreign wages yields that they are determined by the sign of the following expressions respectively (see Appendix Section A.3 for a step-by-step solution):

$$sgn(\frac{\mathrm{dm_d^*}}{\mathrm{dw_f}}) = sgn(-\frac{w_d}{w_f^2}u'(m_h^*) + \frac{(w_d - w_f)m_d^*}{w_f^2}u''(m_h^*) - \beta\frac{w_d}{w_f^2}), \tag{1}$$

$$sgn(\frac{\mathrm{dm_f^*}}{\mathrm{dw_f}}) = sgn(\frac{1}{w_d}u'(m_h^*) + \frac{(w_f - w_d)m_f^*}{w_d^2}u''(m_h^*) + \alpha\frac{1}{w_d}). \tag{2}$$

Intuitively, changes in the foreign wage cause income and substitution effects to the households at origin. Due to the negative shock at destination, foreign labor markets become relatively less attractive, constituting a substitution effect that pushes all families to reduce the amount of foreign labor supply. Simultaneously, the reduction in remittances from foreign migrant wages makes families left behind poorer, which implies an income effect that increases the incentive for additional migration to secure minimum

[14] An alternative way of interpreting this assumption is that $\underline{c}$ are the minimum returns from migration needed 1) to make the household migration investment profitable over a fixed migration duration when financed through household assets or, 2) to service debt repayments when financed through credit and that falling below this threshold corresponds to default.

[15] Note that abstracting from the adaptation of the minimum consumption level is of analytical convenience and helps focusing the model's comparative statics on the essential effect of labor allocation across different destinations. A modification of this assumption that allows positive decreasing marginal returns to additional consumption does qualitatively yield similar predictions.

consumption levels. The difference between these two effects ultimately determines the elasticity of domestic and foreign labor supply with respect to foreign wages. The specific sign of each elasticity depends on the shape of the utility function, the cost parameters, the relative wage premium of foreign to domestic migration and the magnitude of the shock. In Appendix Section A.4, I provide a calibration exercise which demonstrates a situation under which the income effects outweighs the substitution effect and households respond by reducing domestic and increasing foreign migration in response to the shock abroad. Heterogeneous household responses then originate from households' differential remittance dependence, i.e. the share of foreign remittance ($w_f m_f$) over consumption (c). High remittance dependence households experience a strong income effect, which may result in increased foreign migration, while low dependence households will remain rather resilient. For simplicity, this framework abstracts from the selection aspect of the household migration decision and it remains an empirical question how families select additional foreign migrants from available members.

Although this framework relies on the change of the foreign wage level as the exogenous parameter, there is evidence that the period of study during the Great Recession was characterized by nominal wage rigidities in several destination countries, especially for low-skilled workers receiving minimum wages (McKenzie et al., 2014; Cadena and Kovak, 2013). Therefore, in my empirical strategy, I use changes in the level of unemployment, which is a more suitable proxy for economic shocks in this case. Alternatively, one could also change the definition of w_i to capture the expected wage, which is a weighted average of the effective wage and the probability of being employed at destination (Harris and Todaro, 1970). In such a framework, the empirical effects would then capture changes in the probability of being employed given a constant level of wages.

3 Background

3.1 Migration in Vietnam

Vietnam provides an interesting setting for this study as the country has been experiencing a sharp increase in both domestic and foreign migration since the beginning of the economic and political liberalization of the early 1990s (*Doi Moi*). These economic reforms also triggered a liberalization of the historic household registration system (*Ho Khau*), which closely regulated people's movement and constituted high barriers to migration (Hardy, 2001). The result was a sharp increase in both domestic and, subsequently, foreign migration and remittances receipts (Abella and Ducanes, 2011). Nowadays, domestic migration is widespread and 6.6 million individuals were considered domestic migrants as of 2009 (Marx and Fleischer, 2010).[16]

The surge in domestic migration alongside the release of comprehensive panel datasets covering this theme, has led to a growing literature dedicated to the causes and consequences of domestic migration in Vietnam. Similar to patterns found in other developing countries, domestic migrants tend to be relatively young and more educated than the average citizen in Vietnam (Coxhead et al., 2015). The main motive for domestic migration in Vietnam are better employment opportunities and higher wages in the industrial sector of urban centers and surrounding provinces, compared to rural areas.

Domestic migration tends to be relatively inexpensive in Vietnam and migrants usually find low-skilled jobs rather quickly. Due to the high concentration of capital investments and off-farm job creation in certain sectors and provinces, domestic labor mobility has been identified as an important mechanism for spreading welfare gains across the country (Phan and Coxhead, 2010). Especially for the rural population, seasonal migration is an important way of increasing household expenditure and alleviating poverty (Brauw and Harigaya, 2004). Furthermore, domestic labor migration is also used as a shock-coping strategy in rural areas in order to smooth negative shocks to agricultural incomes (Gröger and Zylberberg, 2016).

[16]This corresponded to 8.6% of the total population, compared to 4.5 million (6.5%) during the previous census round in 1999.

In contrast, there is a general lack of data and empirical evidence on international migration in Vietnam. Aggregated data confirms that the stock of foreign migrants from Vietnam has been increasing strongly in recent years (United Nations, 2013). For 2008, Dang et al. (2010) estimated that 1 million Vietnamese were living abroad, corresponding to 1.2% of the total population.[17] Remittance receipts also grew rapidly and reached approximately 8.3 billion USD in 2010, constituting 7% of GDP (World Bank, 2018). During recent years, an important channel of international migration was the country's labor export program (Ministry of Foreign affairs of Vietnam, 2012). Alternative channels are overseas family reunification and other forms of sponsorship. Independent of the channel of migration, economic motives are the main driver of foreign migration and migrants typically remit large shares of their overseas income.[18]

3.2 Household and Migrant Data

The analysis in this paper focuses on Vietnamese households with international migrants having left prior to the onset of the Great Recession who were, therefore, exposed to the deterioration of labor market conditions abroad through their migrants. Data on households and their migrants was collected in two rounds in 2008 and 2013 among a stratified random sample in Vietnam.[19] Households were selected into the sample if they had at least one migrant abroad during the baseline in 2008 who had left the household within ten years. Detailed information on all nucleus member as well as domestic and international migrants was collected through proxy respondents, usually the head of the household. Out of the initial sample of 576 migrant households interviewed in the baseline survey, 546 of them could be successfully tracked in the follow-up survey. Accounting for missing observations, in the empirical analysis I am left with a sample size of 507

[17]Note that these figures refer to recent flows and stocks of Vietnamese migration after 1998 and exclude the approximately 2 million political refugees who left the country between 1975 and 1995.

[18]Due to a lack of migration survey data, academic research on international migration in this country context is thus far very limited. I know of only three studies conducting (non-causal) econometric analyses (Nguyen et al., 2011; Nguyen and Mont, 2012; Binci and Giannelli, 2018).

[19]The first round of this survey was commissioned by the Global Development Network (GDN) and the Institute for Public Policy Research (IPPR) as part of a global project under the name *Development on the Move* (DOTM). See Chappell et al. (2010) for a technical report on the global project and Dang et al. (2010) for details on the survey in Vietnam, including the sampling procedure. The follow-up round in 2013 was organized by the author.

households.[20] This translates into an attrition rate of 12% over 5 years or 2.4% per year, which is remarkably low compared to similar datasets.[21]

[Table 1 here]

Panel A of Table 1 shows the geographical distribution of international migrant individuals from the sample households across the top 10 destination countries recorded in the baseline survey. Among those, the United States of America stand out as the single most important destination country with 27.7% of the total sample. Taiwan comes in second with 14.9%, followed by Malaysia (9.2%), South Korea (8.7%), Germany (6.6%), and Russia (6.3%). Together, the top 10 destination countries listed account for 87.5% of the total sample of migrants, with the remaining 12.5% spread over 21 other destinations.

Table 2 provides descriptive statistics on foreign migrant individuals. They tend to be relatively young, with a mean age of around 31 years. Due to the sampling strategy, migrants captured in the sample have left the household between 1998 and 2008, with the median migrant having left in 2005. 56% of migrants are female and 62% are reported to be married. The majority of migrants have achieved at least a secondary level of education and 13% a tertiary degree before departure. As for migration motives, economic considerations are most frequently reported (55%), followed by family- (43%), and education-related reasons (17%). However, even if not explicitly reported, economic motives and remittance sending ultimately play a key role for any kind of migration decision among my sample households.

[Table 2 here]

Table 3 presents summary statistics on the main outcome variables of migrants' families left behind in Vietnam. Motivated by the theoretical considerations outlined above, the sample is divided into low and high remittance dependent households using their level of per capita expenditure in 2008 with respect to the median as a proxy. This approach

[20] Including individual information from 665 foreign migrant individuals and 2,170 household members and domestic migrants in the balanced version.

[21] In the robustness checks, I conducted additional tests which show that, in addition to being small, attrition does not bias my estimates.

is preferable compared to using the share of remittances over expenditure directly, as remittances is a noisy measure, which suffers from reporting bias for several reasons. The expenditure measure used is highly correlated with remittance dependence. Remittances among high dependence households accounted for over 53% of total expenditure in 2008 on average, while this figure was only 17% for low dependence households. Low and high dependence households were different in several aspects. With respect to demography, high dependence households were larger in size, with 4.6 nucleus members (excluding any migrants) compared to low dependence ones with 3.85 in 2008. In line with the sub-sample selection criteria, domestic income was also different for the two subgroups with 1,694 USD per capita for the high versus 4,097 USD for the low dependence households respectively.[22]

[Table 3 here]

Given the sample stratification strategy, all households have at least one foreign migrant abroad during baseline, such that: $p(migrant) = 1$, for both subgroups. The mean number of migrants per household was 1.2 for high and 1.36 for low dependence households during the baseline, with 84% (78%) of the former (latter) households having just one migrant, while 16% (22%) have two or more. While sample migrants are spread across many different destinations, the number of destinations is rather concentrated within households, with only 4% of the sample having migrants in different destination countries simultaneously. The distribution of migrants' educational attainment prior to departure is also polarized between the two subgroups: high dependence households' distribution is more concentrated in the lower tail and *vice versa* for low ones.

In terms of domestic migration, about 20% of households report a domestic migrant, with the total number of domestic migrants being twice as high for the low compared to the high dependence subgroup. While the incidence and number of domestic migrants increases for both subgroups over time, the trend is more pronounced for the high

[22]Note that all monetary variables are expressed in real USD (PPP) per adult capita. High dependence households were still considerably richer than the average Vietnamese non-migrant household that earned 1,165 USD per capita in 2008 according to the World Development Indicators.

subgroup, with 20% of the sample changing status over time and the mean number of domestic migrants increasing more than threefold.

3.3 Shock Measure Construction

To construct migrant labor market shocks, I combine cross-sectional information on foreign migrants' destinations and their skill levels prior to migration with time-varying data reflecting the skill-specific change in unemployment rates at destination during the crisis years. Using unemployment rates instead of alternative measures of economic shocks, such as GDP, allows me to exploit variation within each destination.[23]

[Figure 1 here]

While unemployment rates started to rise in most countries only in 2008, few countries experienced a rise in 2007 already (most notably Japan, UK, and the USA). After steep, but highly differential increases in the unemployment rates across countries, levels peaked in 2009. In order to capture the crisis impact, my analysis relies on the changes in unemployment rates from the start of the crisis in late 2007 to its peak in 2009. Consequently, the benchmark shock measure is calculated as follows:

$$Shock_h = \frac{\sum_{d=1}^{D}\sum_{s=1}^{S}(M_{h,d,s,2008} \times \Delta UR_{d,s,2007-2009})}{M_{h,2008}}, \tag{3}$$

with $M_{h,d,s,2008}$ being the number of foreign migrants from household h, at destination d, with skill level s in the baseline year 2008. $UR_{d,s,2007-2009}$ is the destination-skill-specific change in unemployment rates between the crisis years 2007 to 2009. In order to proxy for the level of skills, I use data on migrants' educational attainment prior to departure following the International Standard Classification of Education with 1997 levels (ISCED97). As shown in Table 3, there is considerable variation in migrants' educational attainment across households, such that the benchmark shock measure is strongly

[23]Figure 1 depicts the evolution of unemployment rates in the top 12 migrant destination countries before, during, and after the Great Recession. Due to a lack of data on foreign migrants' sector of employment abroad, I am unable to repeat the same exercise for sector-specific GDP shocks.

household-specific. Columns two to four in panel B of Table 1 report the resulting measure for the main destinations.[24] The distribution of migrant skills across all destinations is concentrated in the secondary education cell (65% of the total number of migrants), followed by the primary (22%), and tertiary category (13%). On average, the effective shock measure decreases with individual levels of educational attainment within destinations, i.e. low-skilled workers experienced stronger labor market shocks compared to high-skilled ones during the Great Recession.

In robustness checks, I also use an alternative shock measure which reflects the simple destination-specific trend in unemployment rates.[25] Note that this measure is destination country-specific for 96% of sample households with one destination reported in the baseline. For them, the shock variable turns out to be the simple destination country average, as listed in Panel B of Table 1 (column 1) and depicted in Appendix Figure 2.

4 Empirical Strategy

In order to establish the causal impact of Great Recession labor market shocks abroad on families left behind at origin, this study adopts a quasi-experimental approach (McKenzie and Yang, 2012). I rely on a unique panel data set of international migrant households in Vietnam, whose migrants were spread over a large set of destination countries worldwide before the Great Recession occurred. The identifying variation comes from unemployment shocks during the Great Recession that affected migrants deferentially, conditional on their destination choice and educational attainment prior to migration. I estimate the following difference-in-difference benchmark equation:[26]

$$Y_{ht} = \beta_0 + \beta_1(Shock_h \times Post_t) + \alpha(X_h \times Post_t) + \gamma_{p(h)t} + \delta_h + \varepsilon_{ht} \quad (4)$$

[24] Note that for ease of exposition, the measure reported is collapsed over three education categories. The actual variation is, however, greater and relies on the complete ISCED97 system with seven categories.

[25] This measure is calculated as: $Shock_d = \frac{\sum_{d=1}^{D}(M_{h,d,2008} \times \Delta UR_{d,2007-2009})}{M_{h,2008}}$, with $M_{d,2008}$ being the number of foreign migrants from household h at destination d during the baseline. $UR_{d,2007-2009}$ is the destination-specific change in unemployment rates between the crisis years 2007 to 2009.

[26] In the following regression equations, I omit those terms which are effectively absorbed by the set of fixed effects included.

where h indexes the household in year t, with $t = 2008$ or 2013. Y_{ht}, the dependent variable will be will be either migration incidence as measured by the number of migrants, measures of the households' demographic composition, or financial outcomes, depending on the specification. $Shock_h$ is the destination- and skill-specific shock measure as calculated in equation 3 and $Post$ is a time dummy which equals 1 for the post-shock period 2013. X_h is vector of pre-crisis household and migrant baseline characteristics. δ_h are household fixed effects and $\gamma_{p(h)t}$ are sets of province of origin-year-specific dummies. ε_{ht} is the error term and standard errors are clustered according to the baseline destination country of foreign migrants.[27]. In order to cope with concerns of over rejection in standard asymptotic tests due to a small and unbalanced distribution of clusters in this empirical setting, I rely on the effective degrees of freedom (EDF) correction proposed by Young (2016).[28]

The coefficient of interest, β_1, reflects the aggregate effect of a unit change in the unemployment rate at destination on the respective outcome among households at origin in Vietnam. The identifying assumption is that if destination labor market shocks faced by migrants had been of the same magnitude, then changes in outcomes at origin would not have varied systematically across families left behind. The main concern with respect to this parallel trends assumption is if the shock measure was systematically correlated with household or migrant characteristics. If the latter were also associated with differential changes in outcomes among families left behind, independent of the shock, this would bias my coefficient estimates.[29] To investigate this potential issue, I conduct a balance test of household and migrant baseline characteristics with respect to the shock measure in Appendix Table 1. The results show no evidence of systematic correlations between

[27]For households who had migrants to more than one destination, the error term is clustered according to the destination country of the eldest migrant (Yang, 2008)

[28]As MacKinnon and Webb (2016) show, this approach is more reliable than the wild bootstrap procedure proposed by Cameron et al. (2008) if the number of treated clusters is small. In this case, the wild restricted bootstrap p-values have a tendency to over reject and the unrestricted ones to under reject and neither of them can be trusted. For this reason, I rely on the EDF p-values as the benchmark criterion for establishing inference throughout the analysis. As recommended by Solon et al. (2015), regressions are unweighted as the sampling probabilities in this setting can be assumed independent of the error term based on the estimation equation.

[29]For instance, this could occur if high expenditure households with more educated members sent migrants to more attractive destinations which, in turn, suffered from the crisis more severely and if these educational characteristics also lead to differential outcomes at origin at the same time.

the shock variable and household or migrant baseline characteristics. According to the EDF p-values, six variables show significant correlations with the shock measure at conventional levels and I control for these variables in all regressions by including them in the vector of pre-crisis characteristics (X_h).[30]

To summarize, I am conducting a difference-in-differences analysis comparing affected with unaffected households at origin depending on their migrants' shock exposure abroad, before and after the shock. Note that through the set of fixed effects included in the estimation equation, my benchmark specification fully controls for time-invariant factors at the level of the origin household as well as province of origin-specific changes over time. In order to test whether households exposed to different treatment levels followed parallel trends ex ante, I conducted the following placebo experiment. Using data on the migration history of members and migrants from the baseline survey, I reconstructed the key outcome variables for my sample households in 2003, i.e. 5 years prior to the baseline survey. I then replicate my benchmark estimation regressing the pre-crisis household outcomes in 2003 and 2008 on the original shock measure 3, i.e. as if the Great Recession had happened five years earlier. This specification is a direct test for the presence of pretreatment parallel trends and the results provide evidence in favor of the identifying assumption.

Based on the considerations outlined above, I am particularly interested in the heterogeneous effects of the shock along the distribution of household remittance dependence. To explore this, following my benchmark estimation, I also conduct a subgroup analysis comparing the reactions of high and low remittance dependence households separately. To explore this, I estimate the following triple difference equation:

$$\begin{aligned} Y_{ht} =& \beta_0 + \beta_1(Shock_h \times Post_t) + \beta_2(Shock_h \times Post_t \times Low_h) \\ &+ \beta_3(Low_h \times Post_t) + \alpha(X_h \times Post_t) + \gamma_{p(h)t} + \delta_h + \varepsilon_{ht} \end{aligned} \tag{5}$$

where Low_h is a subgroup dummy being equal to one if the household's expenditure per

[30]Note that the inclusion of these baseline controls makes little difference to the coefficient estimates in general and, in many instances, increases the estimation precision.

capita level is above the sample median and zero otherwise. For each outcome variable, I estimate the benchmark specification 4 first and then the subgroup specification 5. In the following regression tables, I report β_1 (labeled "$Shock \times Post$" in the Tables) and the triple interaction term β_2 with the subgroup dummy (labeled "$Shock \times Post \times Low$"), respectively. In subgroup specification 5, the coefficient on β_1 reflects the effect for the high remittance dependence subgroup, while β_2 measures the difference in treatment effects between the two subgroups. The separate effect for the low dependence subgroup is determined by the net effect of the two coefficients. I report p-values on the null hypothesis of the linear restriction ($\beta_1 + \beta_2 = 0$).

Given the continuous character of the shock measure, each coefficient reflects the impact of a one percentage point increase in the unemployment rate during the crisis years 2007 to 2009 on the respective outcome measure. However, since the shock measure effectively ranges between -2.0 and +8.9 pp, an alternative interpretation is as follows: multiplying the coefficients by the mean shock measure of 2.3 (4.8) gives the effect for the average shock (respectively of one additional standard deviation). In what follows, I refer to the effect of the average shock, unless otherwise indicated.

5 Results

5.1 Foreign Migration

Results from the analysis of households' foreign migration decisions are provided in Table 4 (gender and labor), Table 5 (destination choice), and Table 6 (skill selection). Starting with Table 4, columns (1) and (2) report the results for the total number of foreign migrants. The coefficient on the full sample in column (1) is positive and statistically significant,[31] indicating an aggregate increase of around 0.15 individuals migrating to foreign destinations in response to the average shock (0.067×2.3). This translates into a 12% increase compared to baseline levels. When analyzing the effects by subgroup in column (2), the coefficient on the high dependence subgroup is positive, statistically

[31]Throughout the analysis, I refer to the bias corrected p-values based on the effective degrees of freedom (EDF) for interpretation (Young (2016)), unless otherwise indicated.

significant and of larger magnitude compared to column (1). The point estimate indicates a strong increase of 0.17 in the number of foreign migrants (+14% compared to baseline levels). The coefficient on the subgroup difference is negative and of smaller magnitude, suggesting that total foreign migration among low dependence households reacted less. The point estimate implies an increase of 0.12 individuals among this subgroup ((0.074-0.023)×2.3), which translates into a 10% increase. Note that the test of joint significance joint significance indicates that the effect for the low subgroup is statistically different from zero.

[Table 4 here]

In columns (3) and (4), I focus on international labor migration in particular, i.e. a subset of foreign migrants reported for having left for labor-related motives explicitly. The point estimate on aggregate labor migration in column (3) is positive, but statistically insignificant. The coefficients in column (4) again have opposite signs, large magnitudes, and are statistically significant. The point estimate for the high dependence subsample is positive and suggests an increase of 0.18 labor migrants in response to the average shock or 20% with respect to baseline levels. In contrast, the point estimate on the subgroup differences is negative, of similar magnitude, and the test of joint significance indicates that the null hypothesis cannot be rejected. This provides evidence that only high remittance dependence households reacted to the shock in terms of labor migration and suggests that the aggregate migration response among low households was driven by non-labor motives exclusively. In columns (5) and (6), I further disaggregate labor migration into female labor migration. While the coefficient in column (5) is small and insignificant, the point estimates on the high subgroup in column (6) suggests an increase of 0.11 in the number of female labor migration abroad (+25%). The point estimate on the subgroup differences is negative, statistically significant, and the test of joint significance suggests no change in female labor migration among low dependence households.[32]

[Table 5 here]

[32]For completeness, Appendix Table 2 reports complementary results on foreign migration by gender and male labor migration.

To explore which destinations new migrants selected into ex-post, Table 5 provides results on migration flows by destination. Given the distribution of foreign migration destinations at baseline, I disaggregate flows into the US vs. non-US, with the latter mainly including European and Asian countries as listed in Table 1. Columns (1) and (2) capture total migration into non-US destinations. The coefficient on the full sample in column (1) is positive and significant, suggesting an overall increase of 0.11 foreign migrants (+12%) to non US countries.[33] Looking at the subgroup specification in column (2), the coefficient on the high subgroup is marginally significant and the one on the subgroup differences is zero. This appears to confirm that there are no differential effects by subgroup. Comparing the magnitudes of the coefficient from column (1) with the one on total migration in Table 4, shows that non-US migration effect accounts for approximately two thirds of the overall effect. Columns (3) and (4) report the results for labor migration to the US. The coefficient on the full sample in column (3) is positive and statistically significant, suggesting an increase of 0.06 individuals leaving for work in the US in response to the average shock (+25%). In the subgroup analysis in column (4), we again observe that the coefficients become larger in magnitude, carry opposite signs, and are statistically significant. The point estimate for the high subgroup is positive, suggesting an increase of 0.13 individuals leaving for work to the US (+60%). On the other hand, the point estimate on the subgroup differences is negative and of similar magnitude, suggesting no effect among low dependence households. Comparing the magnitudes of the effect in column (4) with those on aggregate labor migration in Table 4 shows that the effect on labor migration to the US accounts for 70% of the overall effect on labor migration. For completeness, columns (5) and (6) report the results on labor migration to non-US destinations. All coefficients in this specification are small and insignificant.

[Table 6 here]

Other questions of interest are related to the comparison of established versus new migrants from a given household in terms of skill selection and destination diversification:

[33] In unreported regressions, I also disaggregate non-US destinations further, for example into Asian and EU countries. Despite those tests being underpowered, they provide suggestive evidence that most of the non-US flows are targeted towards Asian destinations.

are additional migrants more or less skilled than previous ones and do they target new destinations or the same ones? Columns (1) and (2) in Table 6 report the results on skill selection. Here, the dependent variable is the average education level of foreign migrants in each household based on the seven stages ISCED-97 scale. The coefficient in column (1) is small, positive, and statistically insignificant. While the point estimate does not rule out a marginal increase in the average skill level, the magnitude appears economically insignificant compared to the baseline mean of 2.67. In column (2), the point estimates become larger in magnitude and carry opposite signs, but remain statistically insignificant. This suggests no effect on intra-household skill selection or, in other words, that new migrants are largely comparable to previous ones from the same household in terms of education levels.[34] Columns (3) and (4) report the results from a specification taking the number of unique destination countries among international migrants from the same household as the dependent variable. Note that the descriptive statistics show very few households actually having a diversified destination country portfolio (approximately 4% report more than one at baseline). The coefficients are generally small and statistically insignificant, indicating no such effect whatsoever. This implies a high degree of path dependency in the selection of destinations among foreign migrants: despite of the shock abroad, additional foreign migrants targeted the same destinations of previous migrants instead of diversifying into new ones. This is consistent with an explanation of household migration networks or chain migration, in which the destination choice of established migrants is highly predictive of the one of subsequent ones. In columns (5) and (6), the dependent variable is a dummy which equals 1 if the destination country of the eldest migrant changed between baseline and follow-up. Note that the coefficients here turn out be statistically insignificant based on the EDF p-values, providing no evidence of crisis related destination changes.

[34] In unreported regressions, I also analyze the average education level of labor migrants. The point estimate on the high dependence subsample is negative and slightly larger than the one for total migration, but it remains statistically insignificant.

5.2 Domestic Migration

The results on households' domestic migration decisions are provided in Table 7.[35] Column (1) and (2) provide the results for the total number of domestic migrants in the household. The point estimate on the full sample in column (1) is negative and statistically insignificant. Looking at the coefficients in column (2), we again observe that the estimates become larger in magnitude, statistically significant and carry opposite signs. The point estimate for the high dependence subgroup is negative and suggests a decrease of 0.17 (0.075×2.3) in the number of domestic migrants in response to the average shock. This translates into a decrease of more than 50% compared to baseline levels of domestic migration. For the low subsample, the effect is zero as indicated by the test of joint significance. Note that the magnitude of the point estimate on domestic migration among high dependence households is almost identical to the one on foreign migration with opposite signs, suggesting a one to one substitution of domestic migrants with foreign ones in net terms.

Columns (3) and (4) present suggestive evidence on domestic labor migration.[36] The results are similar to the previous ones in terms of sign and statistical significance, although of slightly lower magnitude. The coefficient on the high dependence subsample in column (4) thus provides suggestive evidence that the aggregate decrease in domestic migration may be driven by labor migration in particular. Again, the null hypothesis for the test of joint significance cannot be rejected, implying no such correlation among the low subgroup. In columns (5) and (6), labor migration is further diasggregated into flows targeting long-distance domestic destinations, i.e. outside of the households' province of origin. The results are qualitatively and quantitatively similar to the ones on labor migration, providing suggestive evidence that total domestic and labor migration is mainly

[35]Note that there are two different specifications in this table: coefficients in columns (1) and (2) are estimated according to equation 4 and 5, respectively, and can be considered causal effect estimates. Due to missing information on a range of domestic migrant characteristics in the baseline survey, the dependent variable in estimations in columns (3) through (6) is only cross-sectional and estimated as $Y_h = \beta_0 + \beta_1(Shock_h) + \beta_2(Shock_h \times Low_h) + \gamma_{p(h)} + \varepsilon_h$ on the follow-up wave in 2013. For this reason, these coefficients should only be interpreted as suggestive evidence, reflecting correlations instead of causal effects.

[36]Note that this specification captures only permanent domestic migration in the sense that domestic migrants are not considered household nucleus members anymore, based on the survey definition. This excludes temporary or seasonal migration as well as commuting household members.

driven by long-distance movements. This may indicate that families of domestic migrants left behind at the origin are likely to live separated from their migrants for most of the time throughout the year.

[Table 7 here]

Summarizing the findings so far, I find evidence that labor market shocks abroad led to important changes in subsequent migration decisions among families left behind in Vietnam. Migrant households with high remittance dependence at baseline responded by increasing the number of foreign migrants. This increase was driven mainly by labor migration and female labor migration and labor migration to the US accounted for 60 and 70% of the aggregate effect, respectively. Simultaneously, the high subgroup also decreased the number of domestic migrants by about the same margin. Suggestive evidence indicates that this effect could be driven by long-distance domestic labor migration. The differential reactions of high dependence households along the two migration dimensions can be interpreted as a substitution effect between domestic and international migration in response to the crisis abroad. These findings suggest that the elasticity of foreign (domestic) labor migration with respect to foreign wages was negative (positive) for the high subgroup. Interestingly, the magnitudes of the decrease in domestic and increase in foreign migration are almost identical, suggesting a one-to-one substitution in net terms. I find no evidence of changes in skill selection or a diversification in foreign destination portfolios. In contrast, low dependence migrant households remained largely resilient. In what follows, I take stock of the demographic composition of the family left behind and analyze how these changes in migration patterns are reflected at the origin.

5.3 Origin Household

Results on the demographic composition are presented in Table 8 (gender and labor). Columns (1) and (2) capture the total number of household nucleus members (i.e. the household nucleus size, excluding any migrants). The point estimate on the full sample in column (1) is close to zero. In column (2), however, the two coefficients turn out to

be large in magnitude and carry opposite signs. The point estimate for the high dependence subsample is positive, but statistically insignificant. In contrast, the one on the subgroup differences is negative, statistically significant, and of larger magnitude. While the coefficients in this specification have relatively large standard errors and statistical tests are under powered, they suggest, if anything, a modest decrease in the household size among low dependence households.

[Table 8 here]

Looking at the number of workers in column (3), the coefficient is small, positive, and insignificant. In column (4), both point estimates turn out to be small in magnitude and statistically insignificant, indicating no effect on labor supply at origin.[37] Reassuringly, this corresponds to the magnitudes of international and domestic labor migration, which seem to cancel out each other among high dependence households. Columns (5) and (6) capture the number of male household members. While the point estimate on the full sample is zero, the coefficients in column (6) turn larger in magnitude and carry opposite signs. The point estimate on the high subgroup is small and positive, but statistically insignificant, while the one on the subgroup differences is twice as large in magnitude, suggesting a decrease in the number of male members. Note, however, that the net effect is not statistically different from zero.

The previous results are consistent with those on migration for high dependence households as domestic and foreign migration is balanced in net terms for this subgroup and does not lead to a change in the household size. For low dependence households, the results provide suggestive evidence of a decrease in the household size at origin, which can partly be explained by the net increase in foreign (non-labor) migration. Apart from migration decisions, another factor that could explain changes in household size is fertility.[38] Therefore, I shed light on this dimension by focusing the analysis on the gender dimension, cohabitation of intimate partners, and fertility decisions at origin.

[37]Note that this specification captures only the extensive margin of labor supply through the number of household members reported working. Due to data limitations, I do not observe the intensive margin of labor supply.

[38]Mortality could also influence household size and I investigate this in unreported regressions. The coefficients from this exercise are, however, close to zero and provide no evidence of an effect.

[Table 9 here]

Table 9 analyzes the cohabitation of intimate partners and fertility decisions. In columns (1) and (2), I first report the results on the total number of female members. While the coefficient in column (1) is zero, the ones in column (2) are similar to the ones on male members, but of slightly larger magnitude. The point estimate for the high subgroup is positive but statistically insignificant. If anything, it suggests a moderate increase. The point estimate on the subgroup difference is negative, statistically significant, and of larger magnitude. However, the null hypothesis for the net effect cannot be rejected, suggesting no effect among the low subgroup. Despite no changes in the gender balance among household members at origin, an open question is concerning the cohabiting situation of intimate partners, who might have been separated by distance during previous migration spells. In columns (3) and (4), I therefore analyze the number of females of fertile age (16–50 years) who report living in the same household with their intimate partner. While the point estimate on the full sample in column (3) is small and statistically insignificant, the coefficients in column (4) are large in magnitude, statistically significant, and carry opposite signs again. The point estimate for the high dependence subgroup is positive and indicates an increase of 0.10 in the number of women of fertile age cohabiting with their partner (+20%). In contrast, the coefficient on the subgroup difference is negative and of similar magnitude. The test of joint significance does not reject the null hypothesis, indicating no effect for the low subsample. This suggests that the changes in migration patterns resulted in a reunification of intimate partners at the household of origin. One possible explanation is that domestic migrants with an intimate partner left behind selected to return to the origin, while single members at origin left to go abroad instead. In other words, it suggests that the substitution of domestic with foreign migration was partly indirect and not driven by the same individual changing status from domestic to international migrant.[39]

Finally, I analyze the number of young children between the age of 0–5 years (i.e.

[39]In unreported regressions, I also investigate whether household members married in reaction to the shock, so as to rule out that the increase in cohabitation was due to the formation of new partnerships. The results do not provide any evidence of the latter explanation.

those who were born only after the baseline survey). The coefficient for the full sample in column (5) is close to zero and statistically insignificant. In column (6), again, we observe strong subgroup heterogeneity: the point estimate for the high dependence subsample is positive and indicates an increase in the number of young children (0–5 years) of 0.12 for the mean shock (+50%). Note that the magnitude is similar to the one in column (4), which suggests that every couple, previously separated due to migration of the partner, turns out to have had one child on average upon reunification, during the five years between baseline and follow-up. In contrast, fertility among low dependence households did not change. Note that the increase in the number of children also corresponds to the positive coefficient on family size among high dependence households in column (2) of Table 8, for which the increase in fertility appears to be the main driver. In what follows, I provide additional results on remittances and household financial outcomes to evaluate the monetary consequences of the documented changes in migration and demographic composition.

5.4 Remittances and Household Finance

I first analyze how remittances responded to the changes in migration patterns and compare the results to those for household income, changes in liquid assets, and expenditure. A way to understand this exercise is to write down the household budget constraint. In period t, the household generates income y_t^h from its activities at home, receives transfers from domestic and foreign migrant sources $\tau_t = \sum_s \tau_t^s$ $(s \in \{d, f\})$, and adjusts its asset position Δb_t. Transfers are positive if there is a net inflow of remittances to the origin household and Δb_t is negative if the household depletes its assets during the period. Finally, the household consumes c_t, such that: $y_t + \tau_t - \Delta b_t = c_t$. The shock produced a strong decrease in remittances from foreign migrants (τ_t^f) initially,[40] and I want to study households' medium-term financial outcomes after demographic and labor supply adjustments, and whether $\tau_t - \Delta b_t$ is sufficiently large to allow the household to maintain

[40]Due to the timing of the survey, I do not observe the level of remittances in the direct aftermath of the crisis in 2010. Nevertheless, aggregate remittance statistics for Vietnam during the crisis years 2007–2009 leave no doubt about the strong negative effect of the Great Recession on foreign remittance receipts.

constant consumption.

[Table 10 here]

The results are presented in Table 10.[41] Note that the statistical tests presented here are under powered (except in column 8). The results should only be considered suggestive. Columns (1) and (2) report the results on total remittance receipts from foreign migrants. The coefficient in column (1) is positive and large in magnitude (suggesting a 50% increase), but statistically insignificant. In column (2), the point estimate on the high dependence subgroup is positive as well, although somewhat lower in magnitude, but remains statistically insignificant. Columns (3) and (4) present the results on home income. The point estimates are zero altogether, indicating no effect on income among families left behind. This is consistent with the result on the number of working household members in Table 8, which showed no change in response to the shock.

The specifications in columns (5) and (6) capture the change in the household asset position as measured by the stock of savings in cash and kind. The coefficient on the full sample is small and negative, providing suggestive evidence of a general decrease in savings. The estimate in column (6) for the high dependence subgroup is negative and larger in magnitude. If anything, it may indicates that the decrease in assets was affecting particularly high dependence households, since the coefficient on the subgroup difference is positive and of similar magnitude. Turning to the last specification in columns (7) and (8), the coefficient on the full sample is small and negative. In column (8), however, the coefficients become larger, turn statistically significant, and carry opposite signs. The point estimate for the high dependence subgroup suggests a statistically significant decrease in total expenditure of around 12% for the average shock. The point estimate for the subgroup difference is positive and the test of joint significance indicates no effect for the low subgroup.

Taken together, these results provide suggestive evidence that high dependence households achieved to increase remittances by allocating additional labor migrants abroad.

[41] Note that all variables are expressed in logarithmic US$ (PPP) per adult capita, i.e., adjusted by the number of adult nucleus members, excluding any migrants. In unreported regressions, I also find the results to be robust to a specification with total household financial outcomes.

Remittances among low households, however, appear to have recovered even more strongly despite no changes in migration. Potential explanations for this may have been that migrants from the low dependence subgroup were more financially resilient to the initial shock or more able to cope with the shock in the first stage. Home income generation remained generally stable for both subgroups in line with the constant labor allocation. The results also provide suggestive evidence of a negative effect on the asset position (Δb_t) among high dependence households. This is consistent with the fact that foreign migration, especially to high-income countries like the US, tends to be quite expensive for Vietnamese and requires substantial upfront investment on behalf of sending households (Hoang and Yeoh, 2015). Apart from the costs of additional migration, financial resources might have also been used directly to compensate for a loss of remittances in the aftermath of the crisis. With respect to the household budget constraint, the deterioration of the asset position among high dependence households appears to have outweighed the overall gains in remittances, such that this subgroup was forced to decrease expenditure.

6 Robustness Checks

I perform a series of robustness checks that are divided into two groups for the ease of exposition: placebo tests are reported in Appendix Table 3 and modifications of the shock measure and outcome variables in Table 4. Starting with Table 3, panel A presents the results when estimating equation 4 in a placebo shock setup between the years 2003 and 2008 as if the Great Recession had happened five years earlier.[42] Note that this is a direct test for the presence of parallel trends in the pretreatment period, i.e. before the occurrence of the Great Recession. The coefficients are small and statistically insignificant according to the EDF p-values, providing no evidence of any significant correlations between the economic shocks in destination countries and the trends in the outcome variables before the occurrence of the Great Recession. Note that although the coefficient

[42]In this exercise, I rely on demographic recall data from the baseline survey in order to reconstruct the main outcomes of interest at the household level in 2003. I then replicate my benchmark estimation regressing the pre-crisis household outcomes in 2003 and 2008 on the original shock measure 3, i.e. as if the Great Recession had happened five years earlier.

on the subgroup difference in column (6) is weakly significant according to the EDF p-value, the test of joint significance does not reject the null hypothesis for the low dependence subgroup.

In panel B and C, I rely on the sample of non-migrant households from the same survey which, by definition, had not been exposed to unemployment shocks abroad through any migrants. I assign those households the average shock of neighboring migrant households from the same enumeration area.[43] I then estimated equation 4 on the sample of non-migrant households to analyze the correlation of economic shocks abroad on the outcomes of non-migrant households in Vietnam. Reassuringly, the results suggest that labor market shocks in migrant destination countries during the Great Recession did not have any impact at origin other than through households' foreign migrants at the destination.

Panel A of Appendix Table 4 presents the coefficients from the estimations using the alternative shock measure (i.e. destination-specific variation only). Comparing the coefficients across the different specifications shows that the results are both quantitatively and qualitatively comparable to the ones from the benchmark specification. Note, however, that standard errors in some of these tests are slightly larger and significance levels lower, which stems from the fact that the treatment variation of the shock variable in these specifications is vastly inferior, compared to the benchmark one. In panel B, the dependent variable is specified to be the net number of the respective outcome, instead of the total numbers. Consequently, these variables capture the change in the outcome variables between period $t-1$ and t for both waves in 2008 and 2013. Again, the results are very similar, both in qualitative and quantitative terms.

[43]Each enumeration area (EA) is constituted by small sub-village level entities in rural areas or blocks in urban ones, and contains around 100 households, on average. This matching routine appears adequate for two reasons: first, households tend to be quite homogeneous within EAs in Vietnam, which makes them comparable in terms of observable characteristics. Second, migration networks tend to have a strong spatial correlation at the local level and, therefore, foreign migration destinations are highly clustered within EAs. This implies that migrant households from the same neighborhood tend to be highly representative of potential migration options that neighboring non-migrant households are exposed to. On average, there are around 3 households per EA and, in line with the sample stratification strategy, one migrant and one non-migrant household in each of them. In 40 out of 466 EAs where more than one migrant household is present, I randomly chose one of them to be matched to the non-migrant household.

Another potential concern in this empirical setting is related to sample attrition, which can be worrisome if it is correlated with the shock variable. Sample selectivity could then lead to biased estimates. To explore this potential issue, I regress a dummy equal to one for households that could not be tracked in the follow-up survey in 2013 (and zero otherwise) on my benchmark shock measure in the cross-section of households in 2008. The coefficient on the shock measure is small and statistically insignificant, providing no evidence that attrition could be a problem in this setting (coefficient: 0.0061, standard error: 0.0049). Additionally, in unreported regressions, I estimate the benchmark specification on the unbalanced household panel. The results are similar to those from the balanced benchmark regressions.

7 Conclusion

The results presented in this study document that labor market shocks abroad, which translated into income shocks at origin through remittances, led to large and heterogeneous changes in subsequent migration decisions, labor allocation, and the demographic composition among families left behind in Vietnam. High remittance dependent migrant households substituted domestic migrants with international ones. These effects were driven by labor migration in particular, and new foreign migrants were predominantly female and targeted the US. I find no evidence of a diversification of foreign migrant destinations at the household level which is consistent with the presence of kinship migrant networks for facilitating chain migration. The results indicate no changes in intra-household skill selection, but suggest aggregate changes as new migrants left exclusively from the subgroup with lower overall education levels. Previous migrants with intimate partners left behind sorted selectively into returning to the origin, leading to an increase in cohabitation and resulting in an increase in fertility. These results reveal that different types of migration are interrelated and jointly determine migration and development outcomes among families left behind.

These findings have important implications for policy makers both in origin and des-

tination countries concerned with the effects of migration on either side of the corridor. With respect to migration-led development strategies in sending countries, the results in this study can help informing the debate about interrelated (and potentially unexpected) side effects of migration. With respect to the effects of migration at destination, the findings can help improving our understanding of the determinants of migrant inflows and selection issues that may result from such economic shocks at destination. Lastly, the results also provide important implications for migration research in general and calls for a joint analysis of the two types of migration, especially in research concerned with the effects of migration on the family left behind.

The analysis in this article does not account for potential spillover effects. While the impact on the destination country is out of the scope of this paper, sustained immigration despite economic crises raises important questions about the impact on the host economy: where do new low-skilled newcomers work, which jobs are they doing, and how do their skills compete with those of the native population? Also, what role do host country immigration policies play in this context and is there a case for a change in these policies? Further research is required to answer these important questions.

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Tables

Table 1: Top 10 Foreign Migrant Destinations in 2008 and Labor Market Shocks

Panel A: Migrant Destinations			**Panel B**: Shock Measures by education level: $\Delta UR_{d,s}$			
Country	**Count**	**Percent**	ΔUR_d	*Primary*	*Secondary*	*Tertiary*
United States	185	27.7	4.67	7.3 [50]	6.0 [102]	2.8 [31]
Taiwan	99	14.9	1.94	1.5 [45]	2.3 [52]	1.6 [2]
Malaysia	61	9.2	0.45	0.6 [12]	0.5 [43]	-0.1 [4]
Republic of Korea	58	8.7	0.40	0.2 [10]	0.3 [43]	-0.6 [4]
Germany	44	6.6	-0.91	-1.3 [5]	-0.9 [30]	-0.4 [8]
Russia	42	6.3	2.20	6.9 [1]	3.5 [41]	-
Australia	28	4.2	1.20	5.9 [1]	1.9 [19]	0.7 [8]
Japan	26	3.9	1.23	1.6 [1]	1.4 [16]	0.8 [8]
Czech Republic	25	3.8	1.34	3.4 [5]	2.3 [17]	0.6 [3]
Canada	14	2.1	2.33	3.8 [3]	3.2 [7]	0.9 [4]
Other†	83	12.5				
Total	**665**	**100.0**	**2.01**	**3.5 [139]**	**2.5 [412]**	**1.2 [87]**

Panel A *Source*: DOTM data 2008. *Note*: Distribution of international migrants across destination countries reported for the balanced dataset in 2008, including 665 migrants in 30 destinations. Panel B *Source*: DOTM data 2008, IMF World Economic Outlook database, ILO statistical database, World Development Indicators, and national statistical offices. *Note*: The shock measure is the absolute change in the unemployment rate (percent of total labor force) between 2007 and 2009 by destination (column 1) and migrants' educational attainment prior to migration (column 2–4). Measure in column 1 rounded to two digits, columns 2-4 to one. Cell sample size by educational attainment in brackets. Marginal differences in sample sizes between panel A and B due to missing country level or educational attainment data. †: "Other" include Angola, Belgium, China, Finland, France, Hungary, Italy, Laos, Libya, Mexico, Netherlands, Norway, Poland, Qatar, Saudi Arabia, Singapore, Switzerland, Thailand, Ukraine, and United Kingdom.

Table 2: Foreign Migrant Individual Characteristics 2008

Number of observations: 665	*Mean*
Age	31.3
Year of departure	2004
Gender (=female) *(indicator)*	0.56
Marital status is married *(indicator)*	0.62
Highest educational attainment before departure *(indicator)*	
$\leq$*primary*	0.44
secondary	0.43
$>$*secondary*	0.13
Reasons for departure *(indicator)*⋆	
economic	0.55
family	0.43
education	0.17
Frequency of communication with origin *(indicator)*	
$\leq$*weekly*	0.40
weekly$<$*monthly*	0.42
$\geq$*monthly*	0.18

Source: DOTM data 2008. *Note*: Descriptive statistics reported for the balanced panel, including 665 migrants in 30 destinations. ⋆ Three most frequently reported motives for migrant departure: Multiple answers allowed, reasons not mutually exclusive. *Economic* includes "easier to get a steady job", "earn more money", and "send money back". *Family* includes "mutual family decision", "left to get married", and "joined family abroad". *Education* includes "study and get additional qualifications" and "learn to speak another language".

Table 3: Household Descriptive Statistics 2008/2013

Remittance dependence	2008				2013			
	High		Low		High		Low	
	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
				Demography*				
Total household size	4.61	*1.90*	3.85	*1.83*	4.59	*2.20*	3.94	*1.85*
thereof: adults	3.83	*1.56*	2.99	*1.47*	3.66	*1.61*	3.19	*1.44*
thereof: working	2.29	*1.28*	1.78	*1.18*	1.95	*1.19*	1.72	*1.21*
				Finance⋆				
Domestic income	1,694	*1,320*	4,097	*6,518*	2,284	*2,718*	4,301	*6,668*
Foreign remittances	880	*1,335*	857	*1,421*	510	*1,044*	423	*974*
Total expenditure	1,645	*515*	4,838	*2,644*	2,681	*2,283*	4,895	*4,186*
Remittances/expenditure (%)	53.5		17.7		19.0		8.6	
Foreign				**Migration†**				
Probability(migrant)	1		1		0.66		0.71	
Total no. migrants	1.2	*0.53*	1.36	*0.81*	0.95	*0.97*	1.13	*1.12*
thereof: Labor	0.87	*0.65*	0.93	*0.77*	0.72	*0.73*	0.86	*0.88*
conditional on migrant	1.2	*0.53*	1.36	*0.81*	1.44	*0.85*	1.59	*1.02*
No. migrants *(indicator)*								
0	0		0		0.34		0.29	
1	0.84		0.78		0.48		0.48	
2+	0.16		0.22		0.18		0.33	
No. destinations *(indicator)*								
0	0		0		0.34		0.29	
1	0.96		0.96		0.63		0.67	
2+	0.04		0.04		0.03		0.04	
Migrant education *(indicator)*								
pre-primary	0.01		0.02		0.00		0.00	
primary	0.27		0.13		0.35		0.16	
lower secondary	0.29		0.17		0.26		0.18	
upper secondary	0.26		0.39		0.23		0.39	
post-secondary	0.08		0.09		0.05		0.05	
tertiary first stage	0.09		0.18		0.11		0.19	
tertiary second stage	0.00		0.02		0.00		0.03	
Domestic								
Probability(migrant)	0.17		0.22		0.37		0.28	
Total no. migrants	0.22	*0.56*	0.41	*0.97*	0.76	*1.24*	0.50	*1.03*
thereof: Labor	-	-	-	-	0.41	*0.80*	0.29	*0.62*

Source: DOTM panel data 2008–2013. *Note*: Number of observations: 507. Descriptive statistics by subsamples of households level relative to the expenditure per adult capita median in 2008. * Working: Members reported employed or self-employed. ⋆ All monetary variables are expressed in real USD per adult capita. † Foreign labor migration includes former household members being reported to having left the country to work abroad or for one of the following motives: "easier to get a steady job", "earn more money", and "send money back". Migrant educational attainment prior to departure according to International Standard Classification of Education 1997 levels. Domestic labor migration includes former household members being reported to having migrated domestically and were either employed or self-employed during the reference period. ‡ Conditional on the household head being employed or self-employed.

Table 4: Foreign Migration: Gender and Labor

Panel A:	Number of foreign migrants					
	Total		Labor		Female labor	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	0.0672***	0.0744***	0.0374	0.0790***	0.0139	0.0482**
	(0.0181)	(0.0209)	(0.0255)	(0.0254)	(0.0139)	(0.0174)
EDF (p-value)	0.030	0.024	0.341	0.037	0.542	0.031
Shock×Post×Low (β_2)		-0.0232		-0.0818***		-0.0652***
		(0.0172)		(0.0177)		(0.0172)
EDF (p-value)		0.186		0.018		0.013
$\beta_1 + \beta_2 = 0$ (p-value)		0.080		0.354		0.129
Household FE	√	√	√	√	√	√
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	1,014	1,014	1,014	1,014	1,014	1,014
Households	507	507	507	507	507	507
Cluster	26	26	26	26	26	26
R^2	0.246	0.253	0.269	0.281	0.201	0.213
Mean Dep. Var.	1.28	1.28	0.90	0.90	0.45	0.45

Source: Author's calculations based on DOTM panel data 2008–2013. *Note*: † Subsample of households with male foreign migrant at baseline. Each column displays the result of a separate regression based on equation 4 and 5 respectively. I only report the shock coefficient interacted with the *Post* dummy for the follow-up wave 2013 (β_1 in equation 4 and 5) and the triple interaction term with the subgroup dummy (β_2 in equation 5). Cluster robust standard errors in parenthesis. Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016). The F-test p-value is for the null hypothesis of the net effect for low remittance dependence households being zero. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Foreign Migration: Destination Choice

	Number of foreign migrants					
	Total Non US		Labor US		Labor Non US	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	0.0473**	0.0416*	0.0244***	0.0554***	0.0130	0.0236
	(0.0191)	(0.0205)	(0.0050)	(0.0139)	(0.0250)	(0.0248)
EDF (p-value)	0.075	0.108	0.039	0.033	0.698	0.317
Shock×Post×Low (β_2)		0.0026		-0.0525***		-0.0293**
		(0.0147)		(0.0162)		(0.0133)
EDF (p-value)		0.960		0.095		0.216
$\beta_1 + \beta_2 = 0$ (p-value)		0.127		0.614		0.867
Household FE	√	√	√	√	√	√
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	1,014	1,014	1,014	1,014	1,014	1,014
Households	507	507	507	507	507	507
Cluster	26	26	26	26	26	26
R^2	0.296	0.305	0.335	0.370	0.239	0.244
Mean Dep. Var.	0.92	0.92	0.22	0.22	0.69	0.69

Source: Author's calculations based on DOTM panel data 2008–2013. *Note*: † Subsample of households with male foreign migrant at baseline. Each column displays the result of a separate regression based on equation 4 and 5 respectively. I only report the shock coefficient interacted with the *Post* dummy for the follow-up wave 2013 (β_1 in equation 4 and 5) and the triple interaction term with the subgroup dummy (β_2 in equation 5). Cluster robust standard errors in parenthesis. Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016). The F-test p-value is for the null hypothesis of the net effect for low remittance dependence households being zero ($\beta_1 + \beta_2 = 0$). *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Foreign Migration: Skill Selection

	Number of foreign migrants					
	Average skill level		Number destinations		Destination change	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	0.0157	0.0416	0.0271	0.0233	0.0364**	0.0734***
	(0.0381)	(0.0601)	(0.0161)	(0.0208)	(0.0173)	(0.0175)
EDF (p-value)	0.619	0.430	0.225	0.271	0.322	0.861
Shock×Post×Low (β_2)		-0.0443		0.0033		-0.0674***
		(0.0656)		(0.0187)		(0.0215)
EDF (p-value)		0.447		0.823		0.190
$\beta_1 + \beta_2 = 0$ (p-value)		0.941		0.204		0.218
Household FE	√	√	√	√	–	–
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	1,014	1,014	1,014	1,014	507	507
Households	507	507	507	507	507	507
Cluster	26	26	26	26	26	26
R^2	0.382	0.386	0.366	0.371	0.073	0.087
Mean Dep. Var.	2.67	2.67	1.04	1.04	–	–

Source: Author's calculations based on DOTM panel data 2008–2013. *Note*: † Subsample of households with male foreign migrant at baseline. Each column displays the result of a separate regression based on equation 4 and 5 respectively. I only report the shock coefficient interacted with the *Post* dummy for the follow-up wave 2013 (β_1 in equation 4 and 5) and the triple interaction term with the subgroup dummy (β_2 in equation 5). Cluster robust standard errors in parenthesis. Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016). The F-test p-value is for the null hypothesis of the net effect for low remittance dependence households being zero ($\beta_1 + \beta_2 = 0$). *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Domestic Migration

	Number of domestic migrants					
	Total		Labor		Labor long-distance	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	-0.0441**	-0.0749***	-0.0288*	-0.0607***	-0.0289*	-0.0589***
	(0.0209)	(0.0239)	(0.0149)	(0.0163)	(0.0152)	(0.0172)
EDF (p-value)	0.148	0.018	0.250	0.019	0.213	0.018
Shock×Post×Low (β_2)		0.0639*		0.0677***		0.0642***
		(0.0369)		(0.0122)		(0.0140)
EDF (p-value)		0.036		0.003		0.004
$\beta_1 + \beta_2 = 0$ (p-value)		0.819		0.705		0.809
Household FE	√	√	-	-	-	-
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	1,014	1,014	507	507	507	507
Households	507	507	507	507	507	507
Cluster	26	26	26	26	26	26
R^2	0.068	0.081	0.191	0.198	0.191	0.200
Mean Dep. Var.	0.32	0.32	-	-	-	-

Source: Author's calculations based on DOTM panel data 2008–2013 in columns (1) and (2) and DOTM cross-section data 2013 in columns (3) to (6). *Note*: There are two the different specifications of domestic migration in this table. Coefficients in columns (1) and (2) are estimated according to equation 4 and 5 respectively and can be considered causal effect estimates. Due to a lack of information on domestic migrants' occupation in the baseline survey, the dependent variable in estimations in columns (3) to (6) is only cross-sectional. These coefficients are estimated as $Y_h = \beta_0 + \beta_1(Shock_h) + \beta_3(Shock_h \times Low_h) + \varepsilon_h$. For this reason, the estimates should only be interpreted as suggestive evidence, reflecting correlations instead of causal effects. For columns (1) and (2), I report the shock coefficient interacted with the *Post* dummy for the follow-up wave 2013 (β_1 in equation 4 and 5) and the triple interaction term with the subgroup dummy (β_2 in equation 5). Cluster robust standard errors in parenthesis. Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016). The F-test p-value is for the null hypothesis of the net effect for low remittance dependence households being zero. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Origin Household: Gender and Labor

	Number of household nucleus members					
	Total		Labor		Male	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	0.0086	0.0807	0.0183	-0.0020	0.0024	0.0302
	(0.0432)	(0.0547)	(0.0333)	(0.0518)	(0.0259)	(0.0296)
EDF (p-value)	0.906	0.224	0.341	0.851	0.846	0.274
Shock×Post×Low (β_2)		-0.142***		0.0347		-0.0594***
		(0.0337)		(0.0634)		(0.0192)
EDF (p-value)		0.013		0.707		0.010
$\beta_1 + \beta_2 = 0$ (p-value)		0.183		0.648		0.292
Household FE	√	√	√	√	√	√
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	1,014	1,014	1,014	1,014	1,014	1,014
Households	507	507	507	507	507	507
Cluster	26	26	26	26	26	26
R^2	0.077	0.082	0.180	0.182	0.101	0.103
Mean Dep. Var.	4.20	4.20	2.02	2.02	1.96	1.96

Source: Author's calculations based on DOTM panel data 2008–2013. *Note*: Each column displays the result of a separate regression based on equation 4 and 5 respectively. I only report the shock coefficient interacted with the *Post* dummy for the follow-up wave 2013 (β_1 in equation 4 and 5) and the triple interaction term with the subgroup dummy (β_2 in equation 5). Cluster robust standard errors in parenthesis. Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016). The F-test p-value is for the null hypothesis of the net effect for low remittance dependence households being zero ($\beta_1 + \beta_2 = 0$). *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Origin Household: Cohabitation and Fertility

	Number of household nucleus members					
	Female		Female fertile age cohabiting		Children (0-5y)	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	0.0079	0.0524	0.0146	0.0438*	0.0186	0.0512***
	(0.0231)	(0.0314)	(0.0157)	(0.0224)	(0.0110)	(0.0142)
EDF (p-value)	0.954	0.276	0.454	0.084	0.487	0.041
Shock×Post×Low (β_2)		-0.0833***		-0.0567***		-0.0590***
		(0.0208)		(0.0189)		(0.0178)
EDF (p-value)		0.046		0.019		0.036
$\beta_1 + \beta_2 = 0$ (p-value)		0.146		0.241		0.614
Household FE	√	√	√	√	√	√
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	1,014	1,014	1,014	1,014	1,014	1,014
Households	507	507	507	507	507	507
Cluster	26	26	26	26	26	26
R^2	0.068	0.073	0.128	0.137	0.071	0.083
Mean Dep. Var.	2.24	2.24	0.52	0.52	0.24	0.24

Source: Author's calculations based on DOTM panel data 2008–2013. *Note*: Each column displays the result of a separate regression based on equation 4 and 5 respectively. I only report the shock coefficient interacted with the *Post* dummy for the follow-up wave 2013 (β_1 in equation 4 and 5) and the triple interaction term with the subgroup dummy (β_2 in equation 5). Cluster robust standard errors in parenthesis. Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016). The F-test p-value is for the null hypothesis of the net effect for low remittance dependence households being zero ($\beta_1 + \beta_2 = 0$). *** p<0.01, ** p<0.05, * p<0.1.

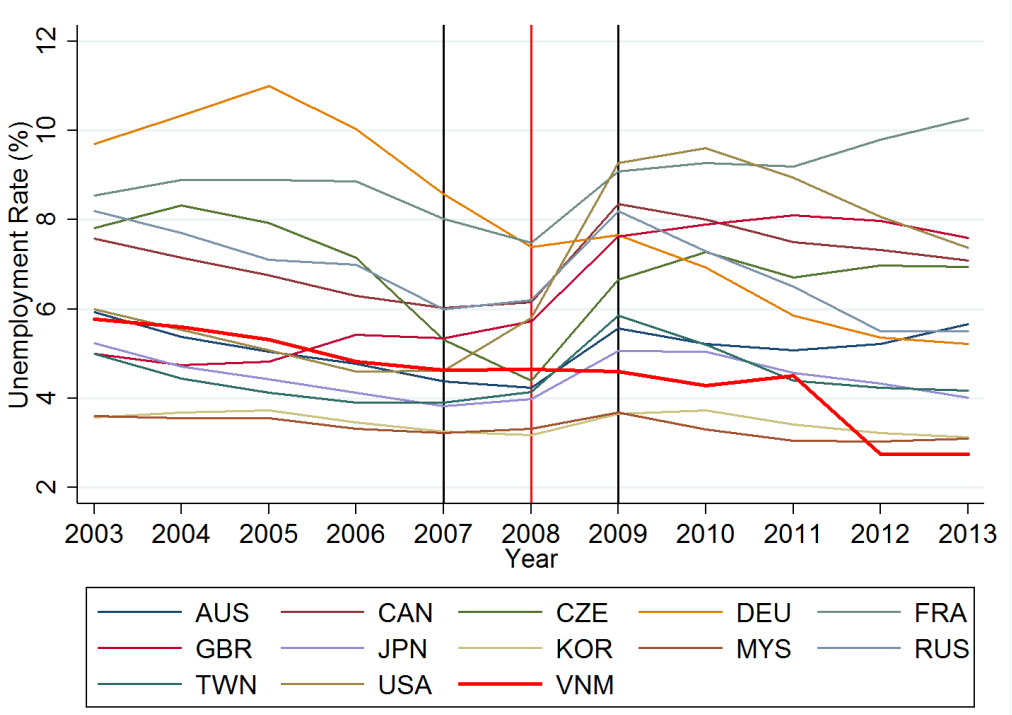
Table 10: Remittances and Household Financial Outcomes

LOG US$ PC	Total remittances		Home income		ΔAssets		Expenditure	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Shock×Post (β_1)	0.211**	0.137	-0.0002	0.0013	-0.0785	-0.136	-0.0342***	-0.0516***
	(0.0791)	(0.100)	(0.0658)	(0.0583)	(0.0867)	(0.121)	(0.0088)	(0.0144)
EDF (p-value)	0.165	0.314	0.477	0.973	0.191	0.208	0.203	0.073
Shock×Post×Low (β_2)		0.104		0.0117		0.136		0.0463**
		(0.111)		(0.0850)		(0.134)		(0.0172)
EDF (p-value)		0.978		0.423		0.583		0.017
$\beta_1 + \beta_2 = 0$ (p-value)		0.139		0.913		0.996		0.716
Household FE	√	√	√	√	√	√	√	√
Province-Year FE	√	√	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√	√	√
Observations	1,014	1,014	1,014	1,014	1,014	1,014	1,014	1,014
Households	507	507	507	507	507	507	507	507
Cluster	26	26	26	26	26	26	26	26
R^2	0.351	0.360	0.163	0.166	0.134	0.138	0.092	0.163

Source: Author's calculations based on DOTM panel data 2008–2013. *Note*: All variables are expressed in logarithmic US$ (PPP) per capita, i.e., adjusted by the number of permanent adult household members excluding any migrants. Income is from labor activities within the household of origin only and net of informal transfers, such as remittances. Remittance receipts from foreign migrants by country of destination. Assets are the stock of savings in cash and kind. Each column displays the result of a separate regression based on equation 4 and 5 respectively. I only report the shock coefficient interacted with the *Post* dummy for the follow-up wave 2013 (β_1 in equation 4 and 5) and the triple interaction term with the subgroup dummy (β_2 in equation 5). Cluster robust standard errors in parenthesis. Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016). The F-test p-value is for the null hypothesis of the net effect for low remittance dependence households being zero ($\beta_1 + \beta_2 = 0$). *** p<0.01, ** p<0.05, * p<0.1.

Figures

Figure 1: Unemployment rates in top 12 destination countries and Vietnam

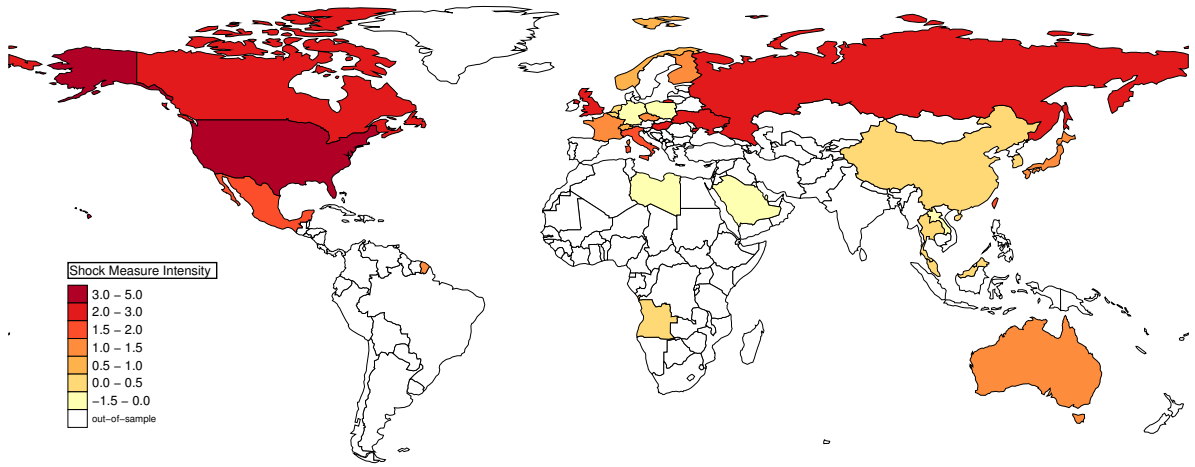


Source: IMF World Economic Outlook database. *Note*: Yearly unemployment rates (percent of total labor force) between 2003 and 2013 in the top 12 destination countries and Vietnam.

Appendix (For online publication)

A.1 Figures

Figure 2: Change in unemployment rate in migrant destination countries 2007-2009



Source: IMF World Economic Outlook database. *Note*: Graphical visualization of percentage point changes in unemployment rate (percent of total labor force) between 2007 and 2009 in migrant destination countries ($\Delta UR_{d,2007-2009}$). Visualization using Pisati (2008).

A.2 Robustness Checks

Table 1: Balance test - Household and Migrant Observables

	Coefficient	Cluster robust SE	EDF (p-value)	Observations
Household head				
Gender	0.121	0.146	0.02	507
Age	-0.0164	0.0076	0.47	507
Marital status married (indicator)	0.119	0.235	0.57	507
Highest educational attainment (indicators)				
Less than primary	-0.291	0.195	0.61	507
Primary	-0.064	0.226	0.87	507
Secondary	0.116	0.175	0.73	507
Post-secondary	0.336	0.423	0.27	507
Employment status (indicators)				
Employed	0.075	0.162	0.47	502
Self-employed	0.085	0.187	0.49	502
Unemployed	0.095	0.367	0.20	507
Retired	-0.629	0.286	0.39	502
Occupation (indicators)				
Professional	0.085	0.282	0.47	507
White-collar	-0.370	0.828	0.86	507
Services	0.262	0.298	0.16	507
Blue-collar	-0.380	0.322	0.19	507
Agriculture	0.655	0.275	0.09	507
Household composition				
No. of members (excl. migrants)	0.035	0.039	0.15	507
No. of working adults	-0.095	0.078	0.51	507
No. of infants (<5 years)	-0.134	0.236	0.571	507
No. of domestic migrants	-0.124	0.067	0.09	507
No. of foreign migrants	0.748	0.111	0.002	507
Household finance				
Income	-0.029	0.047	0.95	507
Savings	0.015	0.031	0.50	507
Remittances	0.037	0.027	0.41	507
Foreign migrant characteristics				
Gender	-0.278	0.350	0.94	507
Age	0.432	0.0.152	0.04	507
Partner left behind (indicator)	0.540	0.628	0.75	507
Highest educational attainment (indicators)				
Less than primary	0.607	0.677	0.59	507
Primary	-0.571	0.260	0.14	507
Secondary	0.870	0.399	0.09	507
Post-secondary	-1.516	0.723	0.12	507
Employment sector (indicators)				
Agriculture	-0.350	0.445	0.34	507
Manufacturing	-0.718	0.0.338	0.12	507
Services	0.822	0.408	0.11	507
Time since departure (indicators)				
less than 1 year	-0.086	0.424	0.74	507
1-2 years	-0.111	0.254	0.33	507
2-3 years	-0.321	0.356	0.66	507
3-4 years	-0.119	0.267	0.60	507
more than 4 years	0.349	0.380	0.38	507

Source: Author's calculations based on DOTM cross-section data 2008. *Note*: Each line displays the result of a separate regression based on equation: $Shock_h = \beta_0 + \beta_1 X_h + \gamma_{p(h)} + \varepsilon_h$ in the cross-sectional baseline dataset of 2008. Cluster robust standard errors in column (2). Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016) in column (3). Income, expenditures, and transfers are expressed in USD (PPP) per capita, i.e. adjusted by the number of permanent household members excluding migrants. *** p<0.01, ** p<0.05, * p<0.1.

Table 2: Foreign Migration: Additional Outcomes

	Number of foreign migrants					
	Female		Male		Male labor	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	0.0324**	0.0438**	0.0355**	0.0336	0.0235	0.0307
	(0.0118)	(0.0159)	(0.0158)	(0.0199)	(0.0188)	(0.0206)
EDF (p-value)	0.049	0.039	0.159	0.351	0.387	0.377
Shock×Post×Low (β_2)		-0.0259*		-0.0015		-0.0166
		(0.0140)		(0.0178)		(0.0185)
EDF (p-value)		0.072		0.479		0.823
$\beta_1 + \beta_2 = 0$ (p-value)		0.354		0.129		0.553
Household FE	√	√	√	√	√	√
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	1,014	1,014	1,014	1,014	1,014	1,014
Households	507	507	507	507	507	507
Cluster	26	26	26	26	26	26
R^2	0.125	0.130	0.225	0.227	0.214	0.216
Mean Dep. Var.	0.72	0.72	0.56	0.56	0.45	0.45

Source: Author's calculations based on DOTM panel data 2008–2013. *Note*: † Subsample of households with male foreign migrant at baseline. Each column displays the result of a separate regression based on equation 4 and 5 respectively. I only report the shock coefficient interacted with the *Post* dummy for the follow-up wave 2013 (β_1 in equation 4 and 5) and the triple interaction term with the subgroup dummy (β_2 in equation 5). Cluster robust standard errors in parenthesis. Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016). The F-test p-value is for the null hypothesis of the net effect for low remittance dependence households being zero. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: Placebo Tests

Panel A	Number of household					
Pretreatment trends	Members		Domestic migrants		Foreign migrants	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	-0.0328	-0.0037	-0.0095	0.0027	0.0327	-0.0040
	(0.0255)	(0.0226)	(0.0077)	(0.0137)	(0.0243)	(0.0199)
EDF (p-value)	0.319	0.901	0.341	0.880	0.153	0.879
Shock×Post×Low (β_2)		-0.0381		-0.0249		0.0621**
		(0.0359)		(0.0241)		(0.0289)
EDF (p-value)		0.456		0.467		0.060
Household FE	√	√	√	√	√	√
Province-Year FE	√	√	√	√	√	√
Observations	1,014	1,014	1,014	1,014	1,014	1,014
Households	507	507	507	507	507	507
Cluster	26	26	26	26	26	26
R^2	0.364	0.376	0.083	0.090	0.516	0.523
Panel B	Number of household					
Non-migrant sample	Members		Domestic migrants		Foreign migrants	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	0.0110	-0.0238	-0.0129	0.0269	0.0011	-0.0025
	(0.0303)	(0.0427)	(0.0301)	(0.0527)	(0.0038)	(0.0068)
EDF (p-value)	0.562	0.665	0.711	0.671	0.984	0.664
Shock×Post×Low (β_2)		0.0557		-0.0617*		0.0067
		(0.0415)		(0.0366)		(0.0059)
EDF (p-value)		0.312		0.300		0.396
Household FE	√	√	√	√	√	√
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	652	652	652	652	652	652
Households	326	326	326	326	326	326
Cluster	68	68	68	68	68	68
R^2	0.074	0.080	0.363	0.379	0.133	0.135
Panel C	Total household					
Non-migrant sample	Home income		Net remittances		Expenditure	
LOG US$ PC	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	0.0483	0.0067	-0.0209	-0.0636	0.0033	0.0132
	(0.0544)	(0.0742)	(0.0366)	(0.0677)	(0.0157)	(0.0170)
EDF (p-value)	0.443	0.923	0.409	0.320	0.648	0.511
Shock×Post×Low (β_2)		0.0671		0.0758		-0.0043
		(0.0673)		(0.0598)		(0.0164)
EDF (p-value)		0.269		0.292		0.851
Household FE	√	√	√	√	√	√
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	652	652	652	652	652	652
Households	326	326	326	326	326	326
Cluster	68	68	68	68	68	68
R^2	0.101	0.103	0.141	0.143	0.138	0.265

Source: Panel A: Author's calculations based on DOTM panel data 2003–2008. Panel B and C: DOTM panel data 2008–2013 *Note*: Each column displays the result of a separate regression based on equation 4 and 5 respectively. I only report the shock coefficient interacted with the *Post* dummy for the baseline wave 2008 in panel A and follow-up wave 2013 in panel B and C (β_1 in equation 4 and 5) and the triple interaction term with the subgroup dummy respectively (β_2 in equation 5). Cluster robust standard errors in parenthesis. Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016). *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Shock Measure and Outcome Variable Modifications

Panel A	Number of household					
Shock measure 2	Members		Domestic migrants		Foreign migrants	
	All	Labor	All	Labor	All	Labor
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	0.135*	0.0117	-0.100**	-0.0935***	0.110***	0.117***
	(0.0748)	(0.0648)	(0.0388)	(0.0199)	(0.0387)	(0.0382)
EDF (p-value)	0.209	0.714	0.098	0.066	0.040	0.119
Shock×Post×Low (β_2)	-0.152**	0.0344	0.0859	0.102***	-0.0306	-0.116***
	(0.0572)	(0.0718)	(0.0532)	(0.0137)	(0.0363)	(0.0343)
EDF (p-value)	0.030	0.877	0.107	0.013	0.232	0.147
Household FE	√	√	√	-	√	√
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	1,044	1,044	1,044	522	1,044	1,044
Households	522	522	522	522	522	522
Cluster	26	26	26	26	26	26
R^2	0.081	0.182	0.353	0.263	0.254	0.280
Panel B	Number of household					
Net number	Members		Domestic migrants		Foreign migrants	
	All	Labor	All	Labor	All	Labor
	(1)	(2)	(3)	(4)	(5)	(6)
Shock×Post (β_1)	0.0925	-0.00750	-0.0715**	-0.0601***	0.0733*	0.0977**
	(0.0614)	(0.0648)	(0.0273)	(0.0163)	(0.0413)	(0.0442)
EDF (p-value)	0.259	0.885	0.026	0.023	0.099	0.091
Shock×Post×Low (β_2)	-0.119***	0.0479	0.0406	0.0710***	-0.0470	-0.119***
	(0.0403)	(0.0603)	(0.0547)	(0.0137)	(0.0310)	(0.0287)
EDF (p-value)	0.054	0.547	0.283	0.006	0.344	0.041
Household FE	√	√	√	-	√	√
Province-Year FE	√	√	√	√	√	√
Baseline controls	√	√	√	√	√	√
Observations	1,014	1,014	1,014	507	1,014	1,014
Households	507	507	507	507	507	507
Cluster	26	26	26	26	26	26
R^2	0.320	0.245	0.569	0.272	0.609	0.479

Source: Author's calculations based on DOTM panel data 2008–2013. *Note*: Each column displays the result of a separate regression based on equation 4 and 5 respectively. I only report the shock coefficient interacted with the time dummy for the follow-up wave 2013 (β_1 in equation 4 and 5) and the triple interaction term with the subgroup dummy (β_2 in equation 5). Cluster robust standard errors in parenthesis. Bias corrected p-values based on the effective degrees of freedom (EDF) calculated using the "edfreg" Stata module (Young, 2016). *** p<0.01, ** p<0.05, * p<0.1.

A.3 Theoretical Framework: Mathematical Derivation

1. **Elasticity of <u>domestic</u> migration w.r.t. foreign wages**

   - Solve the household size constraint for m_h,

   $$m_h = n - m_d - m_f$$

   - the budget constraint for m_f,

   $$m_f = \frac{\underline{c} - w_d m_d}{w_f}$$

   - and replace m_h and m_f in the maximization problem:

   $$\underset{m_d}{\text{Max}} \quad \left\{ u(n - m_d - (\frac{\underline{c} - w_d m_d}{w_f})) - \alpha m_d - \beta(\frac{\underline{c} - w_d m_d}{w_f}) \right\}$$

   - Differentiation w.r.t. m_d, yields the first-order condition:

   $$\frac{\mathrm{dU}}{\mathrm{d}m_d^*} = \frac{w_d - w_f}{w_f} u'(m_h) - \alpha + \beta \frac{w_d}{w_f} = 0.$$

   - Total differentiation yields:

   $$\frac{\mathrm{dm_d^*}}{\mathrm{dw_f}} = -\frac{\frac{\mathrm{d}}{\mathrm{dw_f}}}{\frac{\mathrm{d}}{\mathrm{dm_d^*}}} = -\frac{-\frac{w_d}{w_f^2} u'(m_h^*) + \frac{(w_d - w_f) m_d^*}{w_f^2} u''(m_h^*) - \beta \frac{w_d}{w_f^2}}{\left. \frac{\mathrm{dU^2}}{\mathrm{d}d^2} \right|_{d=d^*}}.$$

   - Since, by assumption: $\frac{\mathrm{dU^2}}{\mathrm{d}m_d^2} < 0$, the sign of the elasticity of domestic migration w.r.t. foreign wages is determined by the sign of the numerator ($\frac{\mathrm{d}}{\mathrm{dw_f}}$):

   $$sgn(\frac{\mathrm{d}}{\mathrm{dw_f}}) = sgn(-\frac{w_d}{w_f^2} u'(m_h^*) + \frac{(w_d - w_f) m_d^*}{w_f^2} u''(m_h^*) - \beta \frac{w_d}{w_f^2}).$$

2. **Elasticity of <u>foreign</u> labor migration w.r.t. foreign wages**

- Solve the household size constraint for m_h,

$$m_h = n - m_d - m_f$$

- the budget constraint for m_d,

$$m_d = \frac{\underline{c} - w_f m_f}{w_d}$$

- and replace m_h and m_d in the maximization problem:

$$\underset{m_f}{\text{Max}} \quad \left\{ u(n - (\frac{\underline{c} - w_f m_f}{w_d}) - m_f) - \alpha(\frac{\underline{c} - w_f m_f}{w_d}) - \beta m_f) \right\}$$

- Differentiation w.r.t. m_f, yields the first-order condition:

$$\frac{\mathrm{dU}}{\mathrm{d}m_f^*} = \frac{w_f - w_d}{w_d} u'(m_h) + \alpha \frac{w_f}{w_d} - \beta = 0.$$

- Total differentiation yields:

$$\frac{\mathrm{dm_f^*}}{\mathrm{dw_f}} = -\frac{\frac{\mathrm{d}}{\mathrm{dw_f}}}{\frac{\mathrm{d}}{\mathrm{dm_f^*}}} = -\frac{\frac{1}{w_d} u'(m_h^*) + \frac{(w_f - w_d) m_f^*}{w_d^2} u''(m_h^*) + \alpha \frac{1}{w_d}}{\left. \frac{\mathrm{dU^2}}{\mathrm{d}m_f^2} \right|_{m_f = m_f^*}}.$$

- Since, by assumption: $\frac{\mathrm{dU^2}}{\mathrm{d}m_f^2} < 0$, the sign of the elasticity of foreign migration w.r.t. foreign wages is determined by the sign of the numerator ($\frac{\mathrm{d}}{\mathrm{dw_f}}$):

$$sgn(\frac{\mathrm{d}}{\mathrm{dw_f}}) = sgn(\frac{1}{w_d} u'(m_h^*) + \frac{(w_f - w_d) m_f^*}{w_d^2} u''(m_h^*) + \alpha \frac{1}{w_d}).$$

A.4 Theoretical Framework: Calibration Exercise

In order to illustrate the comparative statics of this simple model for the discrete case of my sample households, I conduct a simple parametrization exercise. Table 5 summarizes the parameters used in this exercise for a hypothetical household, comparing three periods, before (t_0), when the household faces the shock (t_1), and after adjustment has taken place (t_2). I assume that the household optimally distributes $n = 5$ members across *home*, *domestic*, and *foreign* locations, which corresponds approximately to the mean household size in my sample, including migrants. Discrete optimization is important in this context because households' migration decisions are restricted and the set of potential migration candidates is strictly finite.

Table 5: Parametrization of Household Migration Model

	Period 0	Period 1	Period 2
Domestic wage (w_d)	2	2	2
Foreign wage (w_f)	8	6	6
Home consumption shock (Δc)		-2	
Domestic cost parameter (α)	0.1	0.1	0.1
Foreign cost parameter (β)	0.3	0.3	0.3
		Results	
Members at home (m_h^*)	3	3	3
Domestic migrants (m_d^*)	1	1	0
Foreign migrants (m_f^*)	1	1	2
Consumption ($\underline{c}^*$)	10	8	12

Note: Minimum consumption, $\underline{c} = 10$ units, utility function: $u(m_h) = ln(m_h) - \alpha m_d - \beta m_f$.

Income from home production is normalized to zero and minimum consumption is covered by migrant earnings. Wages from domestic migration are: $w_d = 2$ and remain constant over time. In period 0, foreign migrants earn $w_f = 8$, which implies a considerable wage premium from foreign migration. Furthermore, I assume that foreign migration causes three times more disutility than the domestic one ($\alpha = 0.1$ and $\beta = 0.3$). Since we are interested in the reaction of migrant households, i.e. the ones with $d, f > 0$, the minimum consumption level is assumed to be greater or equal to the earnings of a household with one domestic and foreign migrant each ($\underline{c} \geq 10$). In period 1, a negative labor market shock occurs abroad, which leads to a reduction in foreign wages by 2 units such that $w_f = 6$. This wage loss translates into a relative decrease of 20% in the foreign wage which is in line with the estimates by Cervantes Gonzalez and del Pino (2012) for the accumulated change in remittances from the USA to Mexico between 2007 and 2009 (-19%). It also corresponds to their lower bound estimate for the change in earnings by non-citizen Mexican immigrant workers in the US with post-secondary, non-tertiary education level (-21.7%) during the same period. This subgroup is most comparable to the migrants in my sample, who tend to have no citizenship in their host country and

who predominantly posses a secondary educational degree.

Given ex-ante migration decisions, the foreign wage shock in period 1 leads to a decrease in household consumption to 8 units, below the consumption minimum ($\underline{c}$). In period 2, affected households are now forced to re-optimize their migration decisions in order to secure their minimum consumption needs. They do so by increasing the allocation of labor to foreign markets by one member as the marginal wage abroad is still superior compared to the domestic one they face. As additional foreign migration occurs and the household's budget constraint is satisfied once again, the income from the remaining domestic migrant does not provide any more utility. Due to the household's home bias of locational preferences, they derive positive utility from calling the domestic migrant back home, such that the allocation of members to domestic destinations decreases to zero.

In summary, this simple discrete optimization exercise demonstrates that for households under the given parameters, the model predicts that the elasticity of domestic migration with respect to foreign wages is positive and the one of foreign migration is negative. In other words, the income effect dominates the substitution effect. The optimal coping strategy for the household in this example is to trade-off domestic migrants with foreign ones.

In this setting, heterogeneity in household responses come from differences in their shock exposure. Empirically, households' exposure varies by different factors such as the destination-specific magnitude of labor market shocks or the migrant skill level, both of which I exploit in the construction of the shock measure in Section 3.3. Once allowing for different consumption levels, an additional source of heterogeneity arises from variations in households' level of dependence of foreign remittances over home consumption before the occurrence of the shock. Households who were more dependent on remittances from abroad suffered a stronger consumption shock relative to those who were less dependent. In my empirical analysis, I exploit this variation in remittance dependence to explore heterogeneous effects for high- and low remittance dependent households.