

# Migration and Asset Accumulation in South India

Comparing Gains to Internal and International  
Migration from Kerala

*Ganesh Seshan*



**WORLD BANK GROUP**

Social Protection and Jobs Global Practice

May 2020

## Abstract

This study examines the asset gains to households in Kerala, India, from two types of labor migration: moving overseas versus moving within India for employment. It draws on panel data from waves of a representative household survey conducted in 1998 and 2003. Migrant households as a whole experienced higher asset gains than non-migrant families over this five-year period. Contrary to theoretical

expectations, asset gains were similar for households with an overseas migrant and those with a domestic migrant. Although less educated individuals tend to venture overseas, a wage premium over non-migrants enables them to earn as much in low-skill jobs abroad as more educated workers relocating within India can.

---

This paper is a product of the Social Protection and Jobs Global Practice. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at <http://www.worldbank.org/prwp>. The author may be contacted at [gsheshan@worldbank.org](mailto:gsheshan@worldbank.org).

*The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.*

# **Migration and Asset Accumulation in South India: Comparing Gains to Internal and International Migration from Kerala**

Ganesh Seshan<sup>1</sup>  
World Bank

**Keywords:** Internal migration, international migration, household welfare, assets, India, Kerala

**JEL Codes:** F22, F24, O12, O15, R23

---

<sup>1</sup> Email: [gseshan@worldbank.org](mailto:gseshan@worldbank.org). I thank Dr. Irudaya Rajan and the Center for Development Studies, Kerala for kindly providing the KMS datasets. I am grateful to Arjun Bedi, Daniel Westbrook, and Sulagna Mookerjee for valuable comments and suggestions on an earlier draft.

## 1. Introduction

Employment opportunities for individuals in developing countries that require them to reside away from home often result in split households, where one or more members move, while the rest of the household remains behind. There are two primary pathways along which this sort of migration occurs: A family member moves abroad or, alternatively, to another part of the home country. Typically, there are welfare gains that accrue from this type of labor migration: Previous research has shown that origin households receiving international remittances are more likely to escape poverty; send children to school; make more investments in housing, health, and small businesses; and better withstand adverse shocks.<sup>2</sup> Recent work on domestic migration has also shown that this pathway, too, produces positive gains, with levels of individual consumption growing for movers relative to stayers.<sup>3</sup>

In a sense, any dichotomy between domestic and international migration as an either-or choice is artificial: Notwithstanding formal barriers and resource constraints, households have both options open to them, and may elect to send members to another part of the home country or abroad for employment. How different are the welfare gains experienced by sending households when a family member relocates along one versus the other of these two migration pathways? An answer to this question has both economic and policy implications. It could indicate which migration pathway is more advantageous to pursue, helping inform decision-making within families. Similarly, it could inform labor policies designed to facilitate opportunities for individuals seeking work away from home.<sup>4</sup> Yet, the economics literature has given limited attention to comparing the relative welfare gains from these two migration channels.<sup>5</sup>

---

<sup>2</sup> See Yang (2011) for a recent survey on the impact of international remittances.

<sup>3</sup> See Beegle et al. (2011) and De Brauw et al. (2015).

<sup>4</sup> For example, the Philippines recorded an almost equal number of domestic and international migrants in its 2010 census. But its labor policies are mainly focused on facilitating the employment of overseas Filipino workers (OFWs). In contrast, China is the second largest recipient of international remittances after India, but its government is more intent on regulating urban-rural migration, paying less attention to promoting overseas jobs for Chinese citizens.

<sup>5</sup> Previous work includes Adams (1998), who looked at the impact of external and internal remittances on the accumulation of assets in rural Pakistan, finding that only external remittances increased agriculture land holdings; and Lokshin et al. (2010), who found that domestic migration did more to reduce poverty in Nepal than overseas migration.

In this paper, I examine the asset gains experienced by households with a family member who migrates internationally and domestically. I focus on the state of Kerala, in southwest India. Kerala has for several decades seen its residents relocating for work both overseas and within India, primarily to neighboring states. For Keralites working abroad, the most common destination is the countries of the Arabian Gulf, where they hold temporary contract-based jobs.<sup>6</sup> Using panel data on migrant and non-migrant families from the 1998 and 2003 waves of the Kerala Migration Survey (KMS), I examine the assets accumulated—a measure of medium to long-term economic welfare—by Keralite households over a five-year period. The KMS is the only panel data set of Indian households currently available that can be examined for changes over time in the outcomes of households with members who migrated overseas or within India.

A key challenge in identifying the welfare consequences of migration is the non-random selection of migrant households. This can result in a biased estimation of the relationship between migration decisions and household-level outcomes. No easy solutions to this challenge exist. My strategy in this paper for mitigating concerns about endogeneity bias is to use panel data in conjunction with an instrumental variables approach. The identification strategy exploits two key facts during the period observed: First, Muslim households were far more likely to send a family member overseas and much less likely to send a member to work within India. Second, as migration for employment from Kerala was predominantly undertaken by males during this period, the likelihood of migration increases with the number of prime-age males in a household.

The results of the analysis show that the assets accumulated by households over the five-year interval in terms of housing investments and purchases of durable goods were positively associated with the migration of a family member for work. The asset gains are also statistically similar between households whose members migrated overseas and those whose members moved within India for

---

<sup>6</sup> The 1998 and 2003 KMS data reported that 95 and 90 percent, respectively, of household members in a foreign labor force were residing in the Arabian Gulf. The Arabian Gulf countries consist of the Kingdom of Saudi Arabia, United Arab Emirates, Qatar, Bahrain, Oman, and Kuwait.

employment. Descriptive analysis of the KMS data during this period revealed that among adults participating in the labor force, international migrants from Kerala were drawn from the middle of the education distribution, while domestic migrants were mainly selected from the upper range of the educational spectrum.<sup>7</sup> This fact, coupled with the empirical findings, suggests that for the less educated Keralite migrants moving overseas, there is a wage premium over non-migrants that generates asset gains to the origin household comparable to the gains that the more highly educated individuals moving for employment within India are able to produce. In order to maximize the gains from migration, households in Kerala appear to be behaving strategically when deciding who, and where to send their family members for employment.

In the next section, I present background on migration from Kerala. Section 3 lays out several theoretical considerations. In Section 4, I describe the data and estimation strategy. Section 5 presents the results. I discuss those results in Section 6, with the aim of explaining the key finding that asset gains to households from the two migration pathways are actually similar. Section 7 provides a brief conclusion.

## **2. Background: An Overview of Labor Migration in Kerala**

India's experience with migration is noteworthy, making it an excellent setting for a study of the welfare gains generated by labor migration. With the remittances sent back to the country from abroad reaching nearly US\$78.6 billion in 2018, India receives more money through this channel than any other nation in the world.<sup>8</sup> According to the Reserve Bank of India, the state of Kerala received an estimated 19 percent of India's total overseas remittances in 2017.

---

<sup>7</sup> One sees similar selection patterns with Mexican migrants. Kaestner and Malamud (2014), and the literature they review in that paper, find that Mexican migrants to the United States are drawn from the middle of the Mexican education distribution. Aguayo-Téllez and Martínez-Navarro (2013) show that relatively more educated Mexicans moved within Mexico.

<sup>8</sup> Migration and Development Brief 31, World Bank (2018).

Kerala - the focus of this paper - is regarded as a model of social development in the developing world. When last recorded in 2014, life expectancy was 74.9 years, the highest among states in India. The literacy rate was 94 percent in 2011, compared with 73 percent for India as a whole.<sup>9</sup> Yet despite these laudable achievements in health and education, Kerala has long fared poorly in terms of job creation, suffering from double-digit unemployment rates for decades.

Since the 1960s, these poor prospects at home have compelled Keralites to pursue jobs both in other states within India and abroad. In the 1970s in particular, rising oil prices in the Arabian Gulf countries and the resulting construction boom fueled a significant demand for temporary labor, mostly in low-skilled manual work. Keralites responded to this demand in sizeable numbers (Zachariah et al., 2003). By 1998, 7.3 percent of Keralite households had at least one member in a foreign labor force. In 2003 (the end of the five-year period examined in this study), that figure had risen to 8.4 percent. More recent data from the 2014 wave of the KMS survey show that international migration continues to trend upward, with 18 percent of households having at least one member in a foreign labor force that year.

The share of Keralite households with one or more members participating in the labor force of other Indian states has been considerably lower over time. Between 1998 and 2003, it increased marginally from 3.2 percent to 3.4 percent. By 2014, 4.9 percent of Keralite households had members working in another Indian state (KMS, 2014).

Domestic (or interstate) and international migration from Kerala appear to be competing options for households, with one almost always being chosen over the other. Only infrequently does a single household send family members both overseas and to another Indian state. In 1998, approximately 6.5 percent of migrant households had both domestic and overseas migrant members. This share had fallen in 2014, with less than 3.5 percent of migrant households having members both working abroad and within India.

---

<sup>9</sup> Planning Commission, Government of India, data tables as of August 12, 2014.

Most overseas migrants eventually return to Kerala. International migration, which has been primarily to the countries of the Arabian Gulf, is governed by work contracts that stipulate the duration of employment—typically two years, although contracts are renewable at the employer’s discretion. In contrast, as citizens of India, Keralite migrants to other Indian states could much more easily decide to settle permanently outside Kerala. According to the KMS data, the overall number of domestic migrants who had returned to Kerala as of 2003 was, indeed, lower—approximately 42 percent of the number of overseas returnees.

Overseas remittances from international migrants played an important role in Kerala’s economy over the 1998-2003 interval: In 1998, these transfers were estimated to be around 25.5 percent of the state’s net domestic product (NDP); in 2003, they had fallen to 22 percent (Zachariah and Rajan, 2012), but this is still a notable portion of total NDP. According to estimates from the 2003 KMS data, households with one or more overseas members were receiving an average of US\$1,058 per year in remittances. We know less about the magnitude of domestic remittances sent to Keralite households from migrant family members within India during this period, as the KMS data sets prior to 2014 did not record this category of financial transfer.

In the 64<sup>th</sup> wave (conducted between July 2007 and June 2008) of India’s National Sample Survey (NSS), a large nationally representative household survey, information on remittances was collected for the very first time. In 2007-2008, the average amount of annual overseas remittances received by households in Kerala with at least one member working abroad was US\$1,467. In comparison, the mean amount of domestic remittances received by Keralite households with at least one member working elsewhere in India was US\$641 for the same period. In absolute terms, it appears that domestic remittances per migrant household in Kerala are about half the size of international transfers.

### 3. Theoretical Considerations

Since Stark and Bloom's work on the "new economics of migration" (1985), migration has been recognized as part of a household's strategy for maximizing its welfare. Migration from Kerala for work is appropriately viewed as a household decision rather than an individual choice. The sending household finances migration expenses upfront—particularly for a move overseas—in return for a future stream of remittances from the migrant family member. Migration expenses to the Gulf are costly for low-skilled jobholders from Kerala, averaging US\$1,018 as computed from the 1998 KMS, which was 2.7 times Kerala's per-capita domestic product for that year.<sup>10</sup>

An expected utility model would see a household that receives such remittances choosing between consuming the income and investing it in assets during the early period of migration. The availability of remittance income would then be expected to raise the recipient household's investments in assets in subsequent periods, to the extent that the household were to treat that income as a positive transitory income shock.<sup>11</sup> Remittances from temporary migrants working in the Arabian Gulf can be readily regarded as transitory income for the household back home. There is limited opportunity to settle permanently in these countries or acquire citizenship, and foreign workers earning below a certain threshold are prohibited from bringing their dependents.<sup>12</sup> Existing evidence shows that these "single" migrants transfer the bulk of their earnings back home and for the most part, spend in the host country only on what they require for subsistence.<sup>13</sup> Hence, the origin household's marginal propensity to invest using international remittances is potentially high, given the impermanent nature of overseas migration to the Gulf. A mitigating factor, however, is that a

---

<sup>10</sup> Migrant households must typically cover the costs of an airline ticket, visa, commission to the recruitment agency, and even bribes (KMS, 1998).

<sup>11</sup> Investing in assets should provide a return to justify giving up immediate consumption. This need not be financial gains—for example, housing improvements would offer a stream of future utility to the intended beneficiaries, as would durable goods, such as a vehicle, refrigerator, etc.

<sup>12</sup> For example in Qatar, a minimum monthly income of approximately US\$2,192 is required to bring dependents into the country.

<sup>13</sup> Recent data from a 2013 survey of workers residing in dormitory-style accommodations in Qatar show that nearly 60 percent of a worker's annual income is remitted back home. Most of the low and unskilled migrants in the country live in this sort of dwelling.

higher fraction of Keralite households with members abroad depend exclusively on remittances for income than do households with members working elsewhere in India. This suggests that households with overseas migrants may rely more heavily on remittances for current consumption needs.<sup>14</sup>

On the other hand, the origin household might treat the remittances sent back to it by a domestic migrant as a mixture of transitory and permanent income, and use them for both consumption and investment. The less the household expects its family member's migration to be temporary, the less likely it is to view the transfers it receives as temporary income. Accordingly, the marginal propensity to invest domestic remittances is likely to be lower than the propensity to invest overseas remittances. Another related factor is that an individual who moves within India to work may, at a certain point, start remitting a smaller share of his or her earnings, because the growing prospect of settling long-term or permanently in the new domicile presents additional expenses. This reduction in domestic remittances would then limit the ability of the household back home to make investments comparable in size to the investments made by households receiving overseas remittances, even if the marginal propensity to invest domestic transfers were the same as for overseas transfers.<sup>15</sup>

While the theoretical expectation is that households will invest a greater portion of overseas remittances than they will domestic remittances, the extent to which they actually do so is an empirical question that I investigate in this paper. Yet, migration is not simply a matter of the transfer and receipt of remittances. When a family member moves elsewhere for work, households no longer have access to his or her labor resources, insights, or acumen. If the migrating member used to make financial decisions for the family—for example, as the head of household—his or her departure may compel another member, such as the spouse or parents, to assume this responsibility. This, in turn,

---

<sup>14</sup> The 1998 KMS data show that 38.1 percent of households with international migrants had no member earning wages in Kerala, compared with 20 percent of households with domestic migrants.

<sup>15</sup> A confounding issue could be the *anticipation* of declining remittances over time, as a domestic migrant establishes stronger roots in his or her new domicile. This may lead the recipient household to treat current remittances as temporary flows, therefore raising their propensity to invest it early on.

may have a differential impact on the household's accumulation of assets, compared with households without an absent member.<sup>16</sup> For these reasons, it is more appropriate to examine the broader impact of migration on outcomes for households rather than the impact of remittances alone. The analysis in this paper follows this reasoning, analyzing the impact of migration, instead of remittances, on the assets accumulated by households that have sent family members to work outside Kerala.

#### **4. Data and Empirical Strategy**

##### *A. Data*

In 1998, the first Kerala Migration Survey was completed in Kerala, India. A statewide, representative, demographic survey of 9,995 households across 200 communities (*panchayat*), it was administered between March and November of that year. The KMS was the first in a series of periodic household surveys undertaken by the Center for Development Studies, headquartered in Trivandrum, Kerala. Five years after the first KMS survey, in 2003, the Center for Development Studies conducted a second wave of the KMS covering 10,012 households. A unique feature of the 2003 KMS survey was the creation of panel data: 5,000 households from the 1998 survey were selected for revisits, and the survey team successfully completed 4,795 follow-up interviews, achieving a high re-contact rate of 95.9 percent.<sup>17</sup>

Both the 1998 and 2003 KMS survey waves asked whether any household member had been abroad or in another Indian state at any time prior to or during the survey. Survey teams recorded each of these household members' current and pre-migration occupational status, together with the month and year of their departure from and return to Kerala. These questions from the 2003 KMS

---

<sup>16</sup> In Kerala, people frequently refer to "Gulf Wives Syndrome." This is a way of indicating the plight of a woman whose husband has left to work in the Arabian Gulf, leaving her with a stream of money at the emotional cost of separation and the responsibility of managing the family's affairs in his absence (Zachariah et al. 2003).

<sup>17</sup> The decision to conduct a panel survey was made only after the 1998 KMS was completed. The survey team selected the 2003 panel of households from 125 of the original 200 communities surveyed in 1998. In each community, they interviewed 40 households. Attrition in the panel stemmed from being unable to locate certain households due to a combination of incorrect addresses, and entire households having moved during the inter-survey period. The survey team did not identify which households had moved.

survey were used to classify each household in the panel data set as having no migrants, having one or more members who migrated overseas, or having one or more members who migrated to another Indian state between 1998 and 2003.<sup>18</sup> As noted earlier, only a small fraction of sending households (less than 3 percent) saw members migrating both domestically and internationally for work between survey rounds. I dropped 12 such observations to reach a working sample of 4,783 households.<sup>19</sup> Table 1 displays summary statistics of selected variables. I determined migration status (shown in columns 2 and 3) from the 2003 KMS reports of household members who migrated for work between the 1998 and 2003 survey rounds. In addition, questions in the 2003 KMS enable one to determine the length of time a given household member spent abroad or in another Indian state between survey rounds. I used this variable to measure the duration of a household's exposure to either form of migration.

Within the three migration categories, I used the 2003 KMS data set to obtain individual-level characteristics for household members between the ages of 19 and 60 who were in the labor force as of 2003 (shown in Table 1, rows 1 to 4). The majority of migrants departing for jobs outside Kerala after 1998 were between 19 and 40 years old. Individuals who migrated for work after 1998 tended to be 5 to 9 years younger than non-migrants. Of these, international migrants were on average 4 years older than domestic migrants. About three-quarters of the adult labor force in Kerala consisted of males; the gender breakout of domestic migrants shows a similar male-female ratio. International migrants were almost all male—close to 90 percent.

In terms of educational level, domestic migrants tended to be more educated than international migrants, who in turn had more schooling than non-migrants. The share of domestic migrants, international migrants, and non-migrants who had completed at least secondary schooling was 68

---

<sup>18</sup> Neither the 1998 nor 2003 KMS queried if household members had ever moved within Kerala for work. In my empirical analysis, I treat households whose members moved within Kerala and those without domestic or international migrants collectively as non-migrant households.

<sup>19</sup> The overall results do not change if the 12 household observations are retained.

percent, 52 percent, and 41 percent, respectively. These numbers suggest that domestic migrants typically come from the upper range of the education distribution, while international migrants tend to originate from the middle part of the distribution.

Within the same three migration categories, I primarily used the 1998 KMS data set to derive the household characteristics shown in Table 1. These can be viewed as baseline or pre-migration variables. The exceptions—which I obtained from the 2003 KMS data set—are the number of dependents (e.g., children and spouse) who moved overseas and within India between survey rounds, the number of returning migrants after 1998, and the change in the number of employed household members in Kerala between 1998 and 2003.<sup>20</sup> Over this five-year period, households with one or more overseas migrants saw a larger decline in the average number of working members living in Kerala than households with one or more domestic migrants. This suggests that these international-migrant households became increasingly reliant on remittance income. Households with one or more members who migrated overseas after 1998 were also more likely to have a member who was already working abroad in 1998: 40 percent of such households were recorded as having at least one member in a foreign workforce. Similarly, 27 percent of households with one or more individuals who departed after 1998 for work within India already had a family member in another state's labor force as of 1998.

Overseas migrants tended to emerge from larger households (mean of 6.4 members), while domestic migrants came from households similar in size to non-migrant families (mean of 5.2). Households with members leaving to work abroad over the five-year interval also had more male members between the prime ages of 19 and 40 years (mean of 2.3) than households with domestic migrants (mean of 1.9) and non-migrant families (mean of 1.6). Nearly 50 percent of the migrants

---

<sup>20</sup> Only 5 percent of households with members moving overseas for work had accompanying dependents, compared with 10 percent for households with domestic migrants.

who left to work abroad during this period were from Muslim households. In contrast, Muslim households were among the least likely to see a member migrate to another Indian state.<sup>21</sup>

In terms of economic status, households with members who migrated internationally between 1998 and 2003 came from relatively wealthier households (based on pre-migration land, averaging 71.5 cents,<sup>22</sup> and overall asset holdings). Domestic migrants came from households with holdings similar to non-migrant households (mean of 58.5 cents). I measured asset holdings using a composite index derived from a first principal component weighting of 6 indicators of durable assets ownership and 11 indicators of housing quality.<sup>23</sup> Further elaboration of my method for constructing the asset indices appears in Section 4.B.2.

## B. Empirical Strategy

### B.1. Specification

I examined asset gains by estimating a regression across migrant and non-migrant households, using a difference-in-difference specification with the panel of Kerala households surveyed in 1998 and 2003. The goal of the exercise is to determine the effect that the labor migration of household members between 1993 and 2003 had on the accumulation of assets, all else being equal. Measuring changes in household-level outcomes naturally yields a first-difference regression specification:

$$\Delta W_{i,03-98} = \theta_0 + \theta_1 M_{i,03-98}^{Int} + \theta_2 M_{i,03-98}^{Dom} + \Delta R_{i,03-98} \varphi + X_{i,98} \delta + \Delta \mu_{i,03-98} \quad (1)$$

where  $\Delta W_{i,03-98}$  is the change in household asset holdings between survey rounds in 1998 and 2003 for household  $i$ ,  $M_{i,03-98}^{Int}$  is the number of household members who migrated overseas for employment between survey rounds, and  $M_{i,03-98}^{Dom}$  reflects the number of household members who

<sup>21</sup> Scheduled caste families were the least likely to have a domestic migrant during this period (7 percent). The largest group of households whose members moved within India for employment during this period was Hindus (38 percent).

<sup>22</sup> Landholding is the sum of agricultural and non-agricultural land measured in cents, where 100 cents is equivalent to an acre.

<sup>23</sup> I confined the indicators used in the construction of the overall asset index to a common set found in both survey rounds, in order to examine changes over time. The 1998 KMS data provided a larger set of assets indicators (21 indicators of durable assets and 15 indicators of housing quality). The pair-wise correlation between the composite index created using both sets of indicators was high ( $r=0.93$ ).

migrated domestically to another state for employment between survey rounds.<sup>24</sup> Changes over time in regressors are reflected in  $\Delta \mathbf{R}_{i,03-98}$ , a vector of variables that captures the number of *dependent* household members migrating overseas and domestically after 1998, the number of returning migrants after 1998, and changes in the count of employed household members living in Kerala between survey rounds.<sup>25</sup> As domestic migration may entail greater ease of movement for dependent members of the individual who is migrating, it is necessary to control for such movements between survey rounds. Finally,  $\mathbf{X}_{i,98}$  is a vector of pre-migration (i.e., as of 1998) controls (which is elaborated on later in the paper) that may affect the accumulation of assets and potentially, migration; and  $\mu_i$  is a mean-zero disturbance term. The first differentiation of household-level outcome variables yields a model that is expunged of time-invariant differences across households. The constant term,  $\theta_0$ , accounts for the shared impact across households of changes in Kerala's economy during the five years between 1998 and 2003.

A first-difference specification potentially addresses a key identification concern that arises when examining the impact of migration on household-level outcomes: namely, that migrant households constitute a non-random subset of the population, and in this sense, any estimated relationship between migration and household outcomes may be biased due to sample selection. For example, more entrepreneurial or risk-taking households would be more likely to send a migrant away to work, and accordingly would likely experience greater changes in wealth. Or an adverse shock—for instance, losses incurred in a family business and the consequent sale of assets—may compel a household to send a member away to work as a coping strategy. In analytic terms, this would result in a spurious negative correlation between asset holdings and migration. Similarly, a

---

<sup>24</sup> The majority of migrant households had one member who migrated overseas or domestically during the five-year interval. Only 10.5 percent had two or more members who migrated.

<sup>25</sup> I added the change in the number of employed household members in Kerala as a variable to account for shifts in the influence of income-earning individuals living in the households of origin on financial decision-making and hence, choices about assets.

household desiring to “keep up with the neighbors” by making additional investments in housing may also decide to deploy a member overseas or to another state to earn the money to finance those investments. To the extent that the omitted variables (e.g., risk-taking, illness, business loss, feeling of deprivation) are time-invariant, a first-difference regression at the household level will purge the estimates of such factors.

A limitation of the current empirical specification is the inability to control for *unobserved* household shocks that vary over time—which could simultaneously affect migration decisions and household outcomes. An instrumental variable approach to address such concerns would require finding appropriate instruments that would help to explain migration, but would not directly influence a household’s asset choices. I resorted to using three candidate instrumental variables. The first instrument was motivated by the observation drawn from the KMS data that Muslim households were more likely to send a member to work abroad in the Arabian Gulf, and the least likely to have a member move within India for employment. The former is likely due to shared religious norms and a preference among Gulf recruiters for Muslim employees during this period. The second and third instruments relied on the fact that it was predominantly men who left Kerala to work elsewhere. Young male adults were more suited for the types of low-skilled jobs available in the Gulf nations, and traditional norms in Kerala during the period in question discouraged women from migrating for employment. A household with more young adult male members for a given family size was therefore in a better position to send members away for work, all else being equal. To capture presence of prime-age males over the period between 1998 and 2003, I used a count of all adult male members in a household between the prime ages of 19 and 40, as of 1998—which formed the bulk of all migrants—along with a measure of the change in the number of prime-age adult males between the 1998 and 2003 survey rounds.

The validity of these exclusion restrictions depends on the condition that they do not directly affect asset choices. For example, if Muslim households and households with more prime-age males

are relatively wealthier than other households, or have systematically different preferences, all else being equal, then their asset purchases may differ from other families—even in the absence of migrating members. To tackle these confounding factors, I added controls for initial levels of wealth and preference proxies by including  $\mathbf{X}_{i,98}$ , which serves as a vector of baseline (pre-migration) household and location characteristics as of 1998. The indicators encompassed within this vector are wide-ranging: whether the household has had at least one member who has ever migrated outside Kerala, the number of all adults in the household (age 25 or older, whose education decisions would mostly all have been made by that age) with their various educational attainments, overall household size, the number of male-headed households, the age of the head of household, the highest educational level of the head of household, the inverse hyperbolic sine transformation (IHST) of landholdings, and district-level dummies.<sup>26</sup> My second reason for adding these controls is that, to the extent that unobserved ex-post shocks are correlated with observed pre-migration characteristics of the household or community, incorporating a set of pre-migration controls would further help to mitigate the influence of time-varying unobservables. Robust (Huber–White) standard errors are reported in all cases.

## B.2. Asset Indices

When one examines changes to a household’s welfare, the primary outcomes of interest are measures of its assets. The KMS data sets do not contain income and consumption information, but they do include asset indicators. While this could be interpreted as a limitation of the data, the use of asset holdings may better reflect a household’s long-term economic status and is also less likely to be subject to recall bias or measurement error.<sup>27</sup> To create the asset indices, I followed Filmer and

---

<sup>26</sup> The inverse hyperbolic sine transformation of  $\mathbf{x}_i$  is  $\mathbf{log}(\mathbf{x}_i + (\mathbf{x}_i^2 + 1)^{1/2})$ . Interpretation is analogous to that of a logarithmic dependent variable, without suffering the problem of being undefined at zero.

<sup>27</sup> A household is more likely to report a tangible asset accurately than to be able to recall precisely its consumption in the previous week, month, or year.

Pritchett (2001), using the first principal component that weights more heavily those assets that vary the most across households. An asset common to all households receives zero weight, as it explains none of the variation across the households. Intuitively, commonly held assets are also likely to be of lower value. Accordingly, the resulting indices would also reflect some underlying monetary valuation. In order to make comparisons over time, I pooled the data for 1998 and 2003 to calculate the first principal component. This created constant weights that explained any variation across time, as well as across households.

The asset indicators common to both KMS rounds can be divided into housing quality and ownership of durable goods. There were 11 indicators for housing quality, encompassing different types of homes (5 separate indicators for various building materials and the number of rooms), cooking methods (4 unique indicators), use of electricity, and presence of a landline telephone. The KMS surveys categorized home types into five categories: (i) luxurious (three or more bedrooms with attached bathrooms, concrete roof, mosaic floor), (ii) very good (two bedrooms with attached bathrooms, concrete roof, mosaic floor), (iii) good (one bedroom, brick or cement walls, concrete or tile roof), (iv) poor (brick walls, cement floor, tin or asbestos roof), and (iv) *kutcha* (mud walls, mud floor, thatched roof). For ownership of durable goods, there were 6 indicators, covering ownership of a car, taxi or truck, scooter, television, VCR, and refrigerator.

I created a separate index for each of the two categories of asset indicators—broadly, housing quality and durable goods. I then added an overall assets index, in which all 17 indicators are used together. Each of the two specialized indices has a correlation of 0.9 or more with the overall assets index. The first component accounts for 26 percent, 40 percent, and 27 percent, respectively, of the total variation across the indicators used in the housing quality, durable goods, and overall assets indices.

Table 2 shows the weights or scoring factors of the first principal component for each index. Following McKenzie (2005), I rescaled them by their respective standard deviations in order to

represent the effect of moving from 0 to 1 in the underlying indicator variable. The scoring factors were positive for all indicators, except two: using wood for cooking and living in a brick-wall or mud-walled (“*kutcha*”) house - which were both negatively scored. Owning a home in the “luxurious” category, a car, a VCR, or using liquefied petroleum gas (LPG) for cooking carried the highest positive weight in the overall wealth index. In contrast, using wood for cooking or residing in a home in the “poor” or “*kutcha*” categories had the largest negative scores.

The overall mean and standard deviation of each the 17 indicators as of 1998 are provided in Table 2, Columns 4 and 5. Ownership of assets varied. For example, only 2.5 percent had a car, but 38 percent owned a television. Only 1.3 percent of families resided in dwellings classified as “luxurious,” but 70 percent of homes had electricity. The final three columns of Table 2 show the mean values of each indicator for households, classified by terciles of the overall assets index in 1998 (lowest, middle, upper). The overall asset index is internally consistent, with mean asset ownership varying across terciles. With regard to housing quality, no household in the lowest tercile occupied a home in the “very good” or “luxurious” categories, while 41 percent of households in the upper tercile did. None of the poor households used LPG for cooking, compared with 54 percent of rich households. The lowest tercile of households had 49 percent living in houses classified as “poor,” while only 3 percent of households in the upper tercile did.

With regard to durable goods, ownership of all durable goods increased among the higher terciles. The amount of land owned also rose in the higher terciles, further suggesting that the overall assets index using a principal-component based approach is a reasonable proxy of the levels of a household’s wealth or living standards. This confirms the results of Filmer and Pritchett (2001) and McKenzie (2005). Figure 1 shows a non-parametric regression line that strengthens the positive association between the baseline measure of the overall assets index and landholdings in 1998.

A kernel density plot (Figure 2) of the change in the overall assets index between 1998 and 2003 by migration status indicates a rightward shift in the distribution of wealth for migrant

households. Recall that migration status is based on whether a household had one or more members departing at some time between the 1998 and 2003 survey waves. Figure 3 shows a cumulative density function for the change in the overall assets index by migration status over this five-year period. The distribution of (positive) asset gains for migrant households first-order stochastically dominated the distribution of asset gains for non-migrant families. In other words, the probability of a migrant household experiencing an asset gain of any known magnitude was greater than that of their non-migrant counterparts.

## **5. Results**

### *A. IV First-Stage Results*

The results of a first-stage regression (Table 3) predict a household's participation in overseas and domestic migration. Column 1 presents correlates for the number of international migrants from a household after 1998, while column 2 presents coefficient estimates for the number of domestic migrants from a household after 1998. All three instrumental variables are highly significant individually, while behaving in a predictable manner. The F-test statistic for the number of overseas and domestic migrants is 45.6 and 18.5, respectively. The coefficient estimates confirm that Muslim households were more likely to have an overseas migrant and far less likely to send a member to work within India. Migration along both overseas and domestic pathways was also more likely in households with higher counts of prime-age male members as of 1998, and in households with increases in that count over the five-year interval.

### *B. Welfare Gains*

Do migrant households experience larger gains in assets relative to non-migrant families? And how different are the gains to households from international migrants as opposed to domestic migrants? Table 4 provides answers to these questions obtained from estimating equation (1), using OLS in Panel A and two-stage least squares (2SLS) in Panel B. I present three standardized indices

to capture changes in overall assets, housing quality, and ownership of durable goods between 1998 and 2003.

The OLS estimates in column 1 of Panel A show that having one member migrate overseas after 1998 is associated with a 0.18 standard deviation increase in the growth of the overall assets index over the five-year interval in comparison with non-migrant households, and is highly significant at conventional levels. Over this period, households with a member who migrated domestically to another Indian state for employment experienced a gain of similar magnitude (0.13 standard deviation), although the coefficient is not precisely estimated. The null of equality between the coefficients on both types of migration cannot be rejected (*p-value* of 0.60). When overall asset holdings are broken out into housing quality and ownership of durable goods (Table 4, columns 2 and 3), the results in Panel A show a positive and statistically significant gain for households with members moving abroad. The gain is also positive for households with domestic migrants, although it is not precisely estimated. Again, the null of equality between coefficients for the housing quality and durable goods indices across both migration pathways is not rejected (*p-values* of 0.77 and 0.73, respectively).

When the number of migrants is instrumented (Panel B), the association with gains in assets is more pronounced. Households with overseas and domestic migrants experienced overall asset gains that were 1.2 and 1.3 standard deviations higher, respectively, (column 1) than those of non-migrant households. Both coefficients are statistically significant at conventional levels and the null of equality between the coefficients on both migration pathways is not rejected unambiguously (*p-value* of 0.95). When overall assets are separated into housing quality and ownership of durable goods (Panel B, columns 2 and 3), gains in housing quality to households with one or more international migrants are larger than the associated gains for households with domestic migrants. While the latter's magnitude is lower and imprecisely estimated, the null of equality cannot be rejected (*p-value* of 0.57). On the other hand, households with one or more domestic migrants appear to have experienced

larger gains in purchases of durable goods than households with overseas migrants. The null of coefficient equality for the durable goods index is weakly rejected with a *p-value* of 0.21.

Table 5 displays the results of several identification tests derived from the 2SLS estimation. Focusing on column 1, which shows the validity of the instruments used for the number of international and domestic migrants between survey rounds, one sees that the null hypothesis that coefficients in the first-stage regressions are jointly zero is strongly rejected in each case. Under-identification tests reveal that there are a sufficient number of instruments, and moreover, that weak identification is not an issue. The Hansen's J-test fails to reject the null hypothesis that overidentification restrictions are valid for each case. This confirms that the instruments I used can be validly excluded from the welfare change regressions. The hypothesis that one or more of the instruments is redundant is clearly rejected in each case. Finally, the null hypothesis that entry into migration is exogenous is firmly rejected in all cases. Overall, the identification tests reported in Table 5 indicate that the instrumental variable estimation that I conducted was needed, given that the choice of migration is endogenous, and that the instruments that I selected for the study were appropriate.

### *C. Components of the Asset Index*

Drilling down further, I show the impact of migration on the individual components of the housing quality (Table 6) and durable goods indices (Table 7). Here the impression is slightly more nuanced. I focus on results from the 2SLS estimation (Panel B), as the endogeneity of migration is apparent from the identification tests reported in Table 5. The results suggest that households whose members left to work overseas after 1998 experienced qualitatively larger asset gains—in terms of better housing and purchases of durable goods—than households with domestic migrants.

All households with one or more members migrating away from Kerala after 1998, both domestically and internationally, displayed upward mobility in terms of housing type (Table 6, Panel B, columns 2 to 6). Households with international migrants were more likely to upgrade from a

“good” house to a “very good” house, while families with domestic migrants were more likely to move out of a “poor” or “mud-wall” dwelling into a “good” house. Families with one or more overseas migrants were also more likely to use LPG as cooking fuel instead of kerosene or wood. This is consistent with the tendency for families in this group to occupy homes in the upper range of the housing-quality distribution.<sup>28</sup> Households with one or more domestic migrants were more likely to have electricity in their homes, which is consistent with upgrading to a “good” house. Ownership of a telephone landline increased among households having overseas migrants.<sup>29</sup>

In terms of the ownership of durable goods, households whose members left to work overseas within the five-year interval were more likely to come to possess a taxi or truck, scooter, and fridge. Collectively, these durable goods appear to be of higher value than the goods purchased by households with domestic migrants. In contrast, families with domestic migrants had a greater propensity for purchasing a scooter, television, and VCR (Table 7).

A simple count of individuals migrating over the period between 1998 and 2003 may not adequately capture the degree to which both international and domestic migration affected household outcomes. In general, households with migrants who work away from home for a longer period are likely to accumulate more savings, which they can then use to finance housing improvements or purchase durable goods. To capture the duration of a household’s exposure to a new migration in the five-year interval, I replaced the count measures with two continuous variables that would reflect the sum of time between survey waves that members were working outside Kerala. One of these continuous variables was for overseas migration; the other, for domestic migration.<sup>30</sup> These modifications to equation (1) took the following form:

---

<sup>28</sup> In 1998, only 19.6 percent of “good” houses used LPG for cooking, whereas 54.1 percent of “very good” houses and 86.3 percent of “luxurious” houses did.

<sup>29</sup> The use of electricity jumped by 43 percentage points between occupants of a “poor” house and a “good” house in 1998. Similarly, landline usage increased by 41 percentage points when a family moved from a “good” dwelling to a “very good” house.

<sup>30</sup> In a number of cases where the month of departure during one of the years between 1998 and 2003 was not recorded, I assumed that the migrant had left in the middle of the year.

$$\Delta W_{i,03-98} = \phi_0 + \phi_1 EM_{i,03-98}^{Int} + \phi_2 EM_{i,03-98}^{Dom} + \Delta R_{i,03-98} \gamma + X_{i,98} \lambda + \Delta \epsilon_{i,03-98}, \quad (2)$$

where  $EM_{i,03-98}$  is the sum of time (in years) spent away from home in households  $i$  for members who migrated overseas or within India during the five-year interval.<sup>31</sup>

The results in Appendix Table 1 support the supposition that the longer the migration lasted, the larger the (positive) change in household assets. Using results of the 2SLS estimation shown in Appendix Table 1, Panel B, one can interpret the coefficients in column 1 in the following manner: A household with a family member who worked overseas for a year experienced a 0.55 standard deviation increase in overall asset holdings, while those households with a member who migrated elsewhere in India to work for a year experienced, on average, a 0.60 standard deviation increase in wealth relative to non-migrant households. Both coefficients are statistically significant at the 10 percent level or greater. The test of coefficient equality shows again that when exposure measures are used, we cannot rule out similarity in the gains in assets between households with international migrants and those with domestic migrants (*p-value* of 0.90). The impact of the duration of the migration on the individual components of the housing quality and durable goods indices is shown in Appendix Tables 2 and 3, respectively. The results are qualitatively similar to those found using the count measures (shown in Tables 6 and 7).

## 6. Discussion: Why Are Welfare Gains from International and Domestic Migration Similar?

In Section 3, I introduced the theoretical expectation that overseas migration will produce higher gains in assets for households than domestic migration, because of a tendency to invest a larger share of overseas remittances than domestic remittances. Yet the empirical results of my study show that the two migration pathways generate comparable gains, on average. Why should this be the case? I offer two possible explanations.

---

<sup>31</sup> The mean time away for household members who migrated between 1998 and 2003 was 2.7 years for overseas migrants and 2.5 years for domestic migrants.

The first is that the income earned by overseas and domestic migrants from Kerala may be similar, in light of the educational background of most of the members of these two groups. While the bulk of overseas migrants tend to have a secondary-school education, a majority of domestic migrants have gone on to pursue post-secondary studies. In Figure 4, I show the education distribution of Kerala's migrants, drawing from the 2014 KMS, which collected data on the income of Keralite households. For overseas migrants, there is a clear peak at 10 years of education—the middle of the distribution. In contrast, for domestic migrants, the mass of the distribution is around 15 years of education, or negatively skewed.

The concentration around 10 years of schooling for overseas migrants is not coincidental. India's Emigration Act of 1983 established a requirement that, in order to work overseas, individuals without a secondary school leaving certificate (SSLC)—which one can only obtain by passing a public examination after completing class 10—must apply to the office of the Protector-General of Emigration (PGE) for emigration clearance (Sasikumar and Hussain, 2008). To avoid this bureaucratic process, households that plan to send family members abroad are more likely to do so after those individuals fulfill the SSLC requirement.

With respect to monthly income, Figure 5 shows that overseas migrants with around 10 years of schooling earn amounts similar to those of peers with post-secondary schooling who migrate within India. As most domestic migrants have earnings at least equal to what most overseas migrants make, the gains experienced by migrant households in Kerala, all else being equal, would be similar, on average, across both migration pathways.

A second possible explanation is that migrant households could be allocating similar amounts of overseas and domestic remittances to the types of asset purchases examined in this paper, irrespective of how much money is actually being sent home in either case. A tendency for households—particularly those with domestic or international migrants—to compare themselves socially with other households may lead them to make housing investments and purchases of durable

goods with the aim of leveling the social status, at least in terms of appearances, among migrant households. The 2014 wave of the KMS collected domestic remittance data for the first time. These data reveal that the amount of overseas versus domestic remittances allocated to home investments and durable asset purchases was statistically indistinguishable among migrant households as a whole within the survey sample.

## **7. Conclusion**

Few papers have compared the changes in household welfare associated with international versus domestic migration, despite the fact that families thinking about sending a member away from home to work may have both pathways available to them. This study helps to fill this gap by focusing on households in Kerala, India, that chose one of these two pathways for a family member at some point between 1998 and 2003. Taking advantage of a unique panel data set available for Keralite households over this five-year period, I compare the gains in assets (represented by housing investments and purchases of durable goods) that these two groups of migrant households experienced during that timeframe. The study design is characterized by a double-difference specification with instrumental variables to help account for the non-random selection of households sending members outside Kerala to work.

An intriguing implication of the welfare analysis for the families of these migrants back home is that individual migrants are able to take advantage of international wage differentials—particularly for low or unskilled jobs that require lower levels of education—to generate sizeable gains to their origin households that are equal, if not larger, than the gains that the relatively more educated individuals who migrate domestically are able to produce. If a household can finance the upfront costs of overseas migration, less educated individuals are able to exploit the strong demand in the Arabian Gulf nations for low or unskilled labor, securing contract-based jobs that pay a substantial premium over similar positions back home. This phenomenon could be viewed as the result of

educational sorting, where less educated individuals leave to work abroad, while more qualified individuals move elsewhere in India.

A limitation of this study is that it did not examine how migration—either domestic or international—impacted household investments in education and other classes of assets, such as land and financial resources, because panel data on these variables were not available. If that analysis were included, would we then find the asymmetries in the gains to the households of domestic versus overseas migrants that the theoretical predictions indicate? Additional research that examines a broader set of measures reflecting the economic status of households exposed to domestic and international migration will shed light on this question.

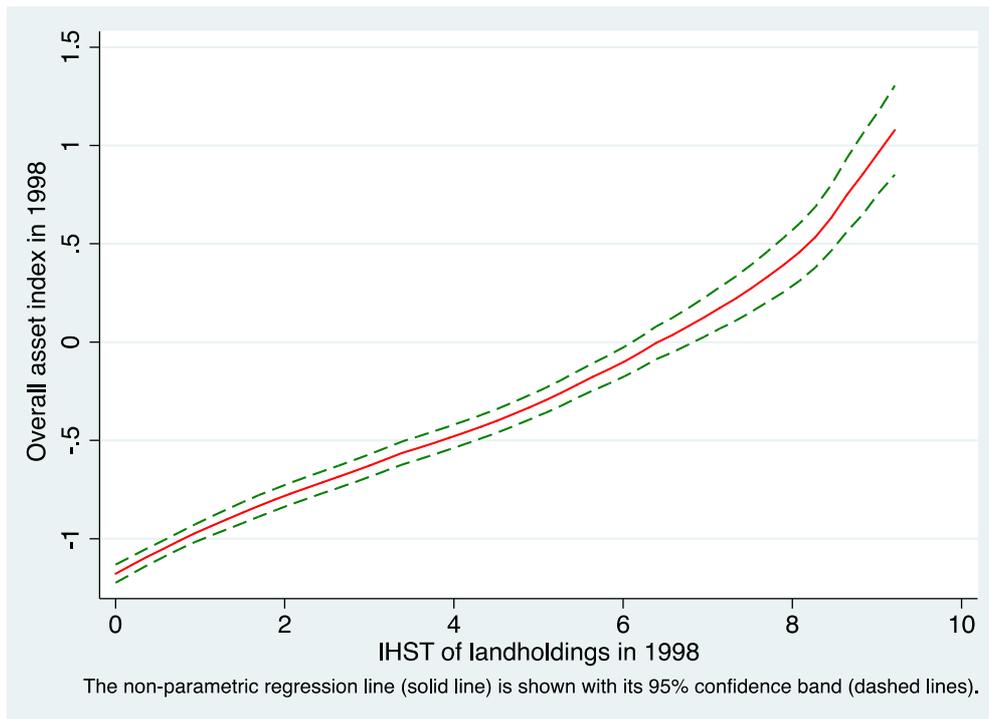
## References

- Adams Jr, Richard H. "Remittances, investment, and rural asset accumulation in Pakistan." *Economic Development and Cultural Change* 47, no. 1 (1998): 155-173.
- Aguayo-Téllez, Ernesto, and José Martínez-Navarro. "Internal and international migration in Mexico: 1995–2000." *Applied Economics* 45.13 (2013): 1647-1661.
- Beegle, Kathleen, Joachim De Weerd, and Stefan Dercon. "Migration and economic mobility in Tanzania: Evidence from a tracking survey." *Review of Economics and Statistics* 93.3 (2011): 1010-1033.
- de Brauw, Alan, Valerie Mueller, and Tassew Woldehanna. "Does internal migration improve overall well-being in Ethiopia?" IFPRI Ethiopia Strategy Support Program II 55 (2013).
- Filmer, Deon, and Lant H. Pritchett. "Estimating wealth effects without expenditure data—Or tears: An application to educational enrollments in states of India." *Demography* 38, no. 1 (2001): 115-132.
- Harris, John R., and Michael P. Todaro. "Migration, unemployment and development: a two-sector analysis." *The American Economic Review* (1970): 126-142.
- Kaestner, Robert, and Ofer Malamud. "Self-selection and international migration: New evidence from Mexico." *Review of Economics and Statistics* 96.1 (2014): 78-91.
- Lokshin, Michael, Mikhail Bontch-Osmolovski, and Elena Glinskaya. "Work-related migration and poverty reduction in Nepal." *Review of Development Economics* 14, no. 2 (2010): 323-332.
- McKenzie, David J. "Measuring inequality with asset indicators." *Journal of Population Economics* 18, no. 2 (2005): 229-260.
- McKenzie, David, and Hillel Rapoport. "Can migration reduce educational attainment? Evidence from Mexico." *Journal of Population Economics* 24, no. 4 (2011): 1331-1358.
- Sasikumar, S.K and Zakir Husain. "Managing international labour migration from India: Policies and perspectives." ILO Asia Pacific Working Paper Series (2008).
- Stark, Oded, and David E. Bloom. "The new economics of labor migration." *American Economic Review*, (1985): 173-178.
- Tumbe, Chinmay. "Remittances in India: Facts and Issues," (2011). Indian Institute of Management Bangalore Working Paper.
- Yang, Dean. "Migrant remittances." *The Journal of Economic Perspectives* 25, no. 3 (2011): 129-151.
- Zachariah, K.C, E.T. Mathew and S. Irudaya Rajan. "Dynamics of Migration in Kerala: Dimensions, Differentials and Consequences," Orient Longman (2003).

Zachariah, K.C. and S. Irudaya Rajan. "Kerala's Gulf Connection, 1998-2011: Economic and Social Impact of Migration." Orient Black Swan (2012).

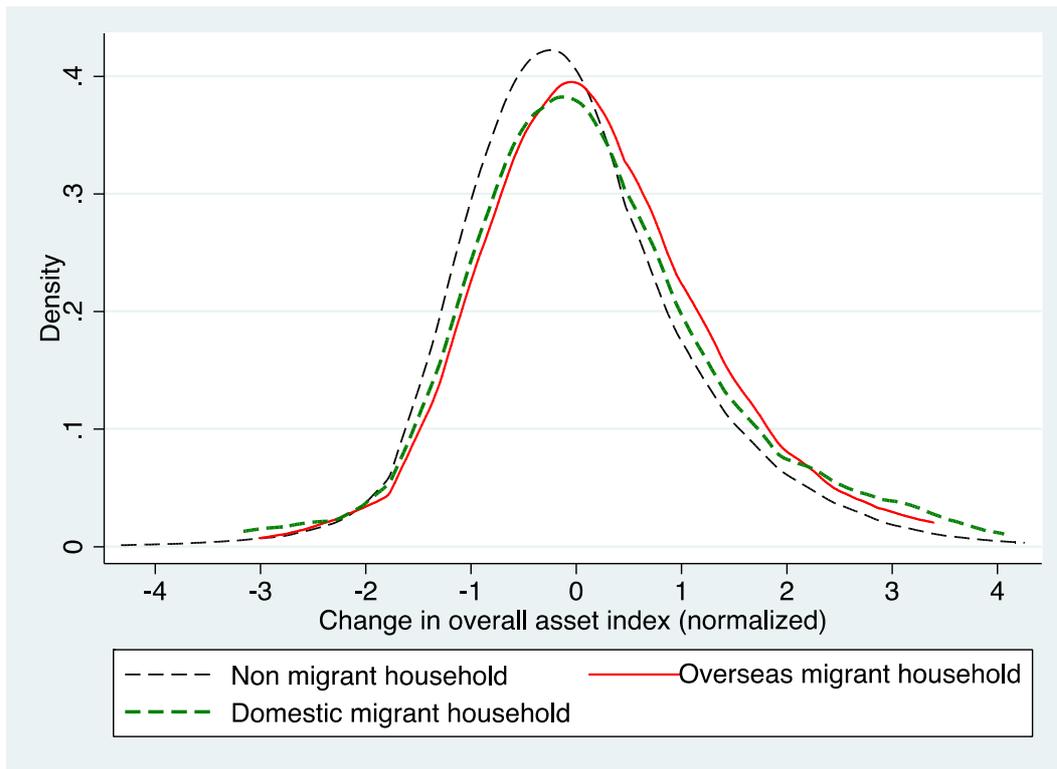
World Bank. "Migration and Development Brief 31." World Bank (2018).

**Figure 1: Overall assets index against landholdings in 1998**



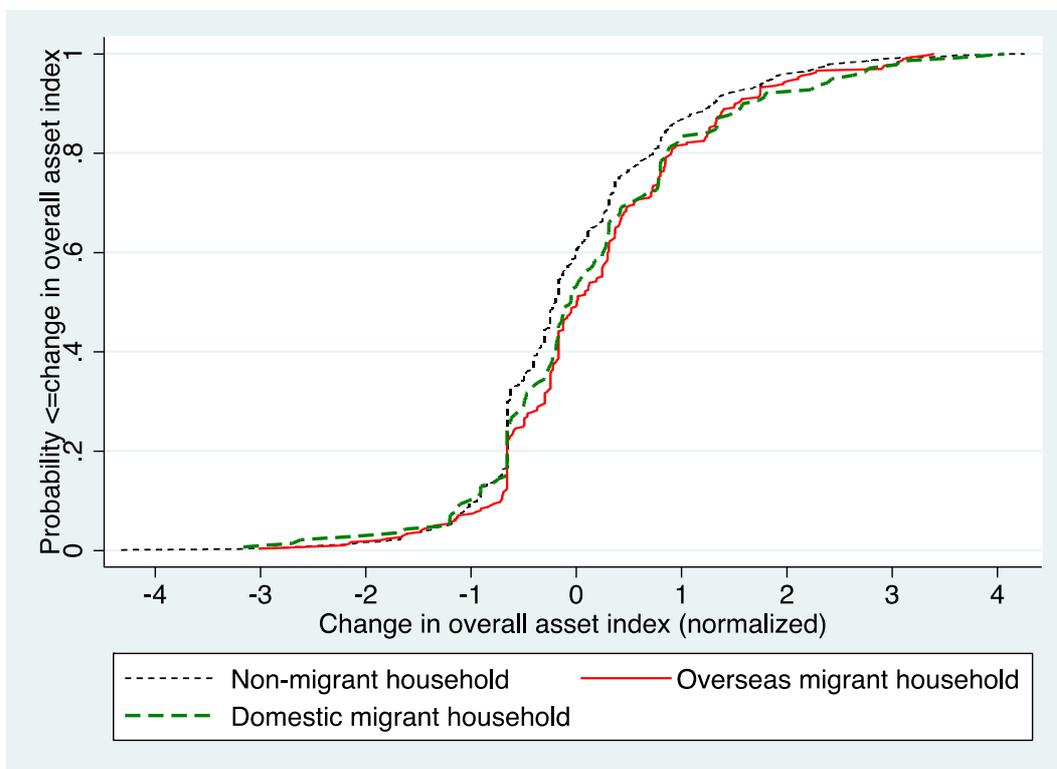
*Source: Author's calculation from KMS 1998*

**Figure 2: Change in overall assets index by migration status (1998-2003)**



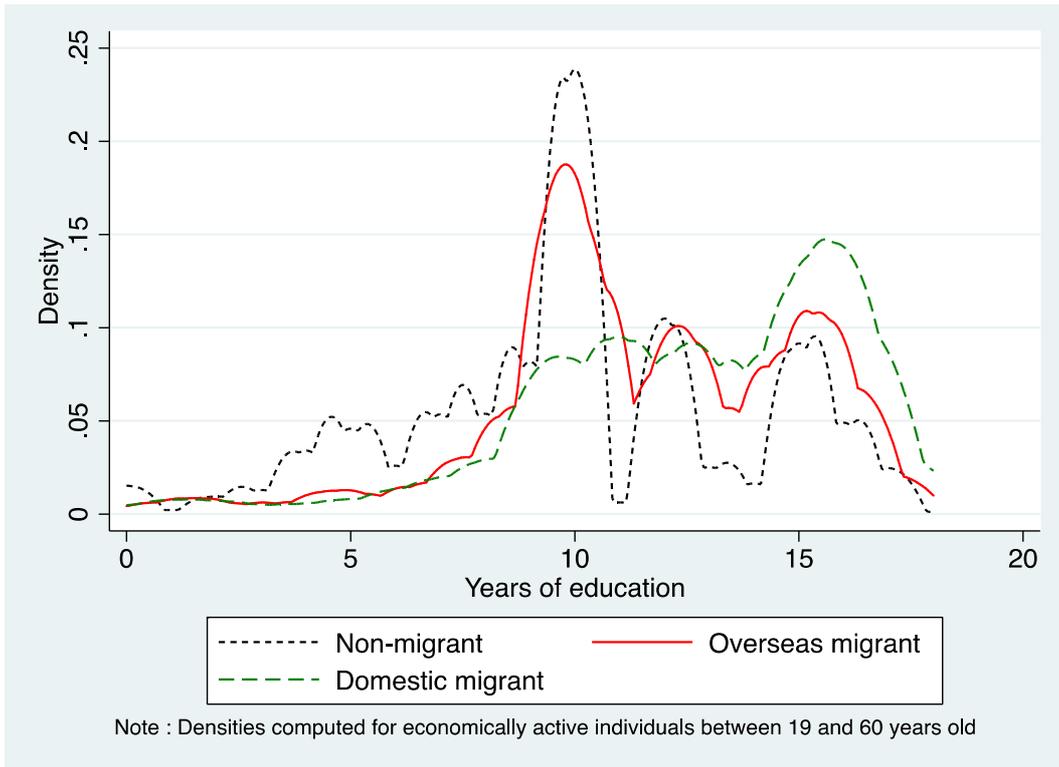
*Source: Author's calculation from KMS 1998 and 2003*

**Figure 3: Cumulative density function of change in overall assets index by migration status (1998-2003)**



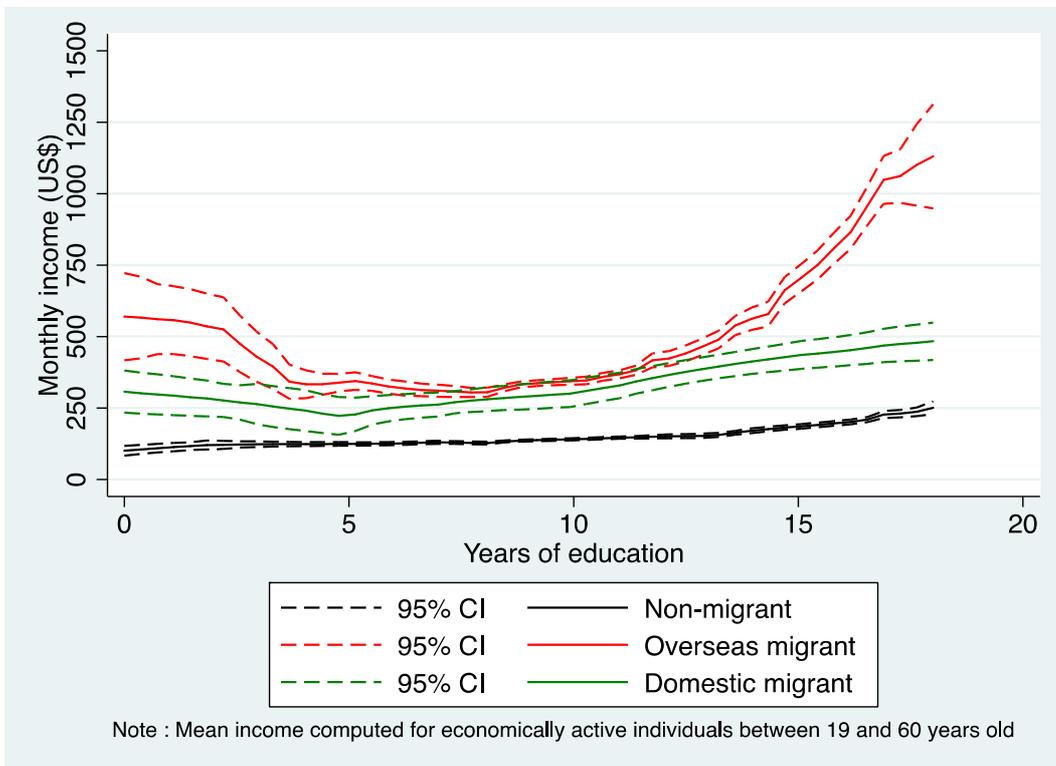
*Source: Author's calculation from KMS 1998 and 2003*

**Figure 4: Education distribution of Kerala's migrants in 2014**



Source: Author's calculation from KMS 2014

**Figure 5: Income distribution by migration status in 2014**



Source: Author's calculation from KMS 2014

**Table 1: Summary statistics of panel households**

	Non- migrant	International migrant	Domestic migrant	T-test of difference (2)-(1)	T-test of difference (3)-(1)	T-test of difference (3)-(2)
	<u>Mean</u>	<u>Mean</u>	<u>Mean</u>	<u>p-value</u>	<u>p-value</u>	<u>p-value</u>
	(1)	(2)	(3)	(4)	(5)	(6)
<b><i>Characteristics of economically active individuals</i></b>						
Age	36.5	31.1	27.1	0.00	0.00	0.00
Age categories:						
19-24 years	0.16	0.11	0.41	0.03	0.00	0.00
25-29 years	0.16	0.42	0.36	0.00	0.00	0.22
30-34 years	0.16	0.22	0.10	0.00	0.05	0.00
35-39 years	0.14	0.12	0.09	0.32	0.06	0.28
40-44 years	0.12	0.08	0.02	0.02	0.00	0.00
45-60 years	0.26	0.05	0.02	0.00	0.00	0.17
Male (indicator)	0.74	0.90	0.75	0.00	0.70	0.00
Highest education level:						
At most some secondary schooling	0.55	0.48	0.31	0.01	0.00	0.00
Secondary completed	0.27	0.33	0.48	0.01	0.00	0.00
Post-secondary education	0.14	0.19	0.20	0.01	0.01	0.70
<b><i>Household characteristics</i></b>						
Proportion of households in 1998 with..						
..at least one member working overseas	0.14	0.40	0.12	0.00	0.64	0.00
..at least one member working in another state	0.06	0.08	0.27	0.11	0.00	0.00
Number of dependents moving overseas after 1998	0.01	0.09	0.01	0.00	0.76	0.02
Number of dependents moving within India after 1998	0.02	0.02	0.16	0.88	0.00	0.00
Number of return migrants from overseas after 1998	0.05	0.13	0.06	0.00	0.56	0.06
Number of return migrants from within India after 1998	0.04	0.02	0.06	0.20	0.25	0.05
Change in no. of employed members in Kerala after 1998	-0.03	-0.52	-0.21	0.00	0.07	0.01
Household size in 1998	5.18	6.42	5.38	0.00	0.30	0.00
No. of male members (19-40 years ) in household in 1998	1.58	2.26	1.92	0.00	0.00	0.00
Muslim household (indicator)	0.17	0.48	0.09	0.00	0.01	0.00
Landholdings (cents) in 1998	58.5	71.5	57.3	0.14	0.93	0.20
Overall asset index in 1998	-0.52	0.09	-0.43	0.00	0.55	0.01
Number of household observations	4347	297	139	-	-	-

Notes: Migration status in columns 2 and 3 is determined by the 2003 KMS survey reports of household members who migrated for work between survey rounds in 1998 and 2003. Economically active individuals (19-60 years of age) are categorized as non-migrant (n=9,016) international migrant (n=344) and domestic migrant (n=167) depending on their residence after 1998. Individual age and education variables are derived from the 2003 KMS dataset. Number of dependents moving overseas and within India after 1998, number of returning migrants after 1998 together with the change in employed members in Kerala between 1998 and 2003 are obtained from the 2003 dataset. All remaining household variables are constructed from the 1998 KMS data.

**Table 2: Principal components and summary statistics for constructed asset indices**

Variables	Scoring factor for 1st principal component (divided by standard deviation)			Summary statistics in 1998		Means by terciles of overall asset index in 1998		
	Housing quality index	Durable asset index	Overall asset index	Mean	Std. dev.	Lowest	Middle	Upper
<i>Housing quality</i>								
Luxurious house	0.990		0.934	0.013	0.112	0.00	0.00	0.04
Very good house	0.875		0.694	0.126	0.332	0.00	0.01	0.37
Good house	0.024		-0.047	0.546	0.498	0.25	0.90	0.56
Poor house	-0.611		-0.444	0.215	0.411	0.49	0.08	0.03
Mud-walled ( <i>kutcha</i> ) house	-0.756		-0.501	0.101	0.301	0.26	0.01	0.00
LPG for cooking	1.149		0.830	0.181	0.385	0.00	0.00	0.54
Kerosene for cooking	0.128		-0.018	0.025	0.156	0.00	0.02	0.06
Wood for cooking	-1.012		-0.708	0.747	0.435	0.88	0.98	0.40
Electric stove for cooking	0.403		0.185	0.001	0.035	0.00	0.00	0.00
Household has a telephone	0.963		0.779	0.150	0.357	0.00	0.00	0.45
Home has electricity	0.778		0.571	0.702	0.457	0.23	0.98	0.99
<i>Durable asset ownership</i>								
Owns a car		1.800	1.070	0.025	0.156	0.00	0.00	0.07
Own a taxi or truck		0.841	0.466	0.019	0.137	0.00	0.01	0.05
Owns a scooter		1.233	0.761	0.091	0.288	0.00	0.00	0.27
Own a television		0.898	0.658	0.378	0.485	0.00	0.38	0.79
Owns a VCR		1.369	0.848	0.099	0.299	0.00	0.00	0.30
Owns a fridge		1.196	0.853	0.193	0.395	0.00	0.00	0.58
Housing quality index				-0.446	1.510	-1.72	-0.77	1.27
Durable asset index				-0.290	1.396	-1.17	-0.81	1.15
Overall asset index				-0.530	1.922	-2.05	-1.15	1.71
Landholding (cents)						25.5	42.7	91.4
Eigenvalue associated with first component	2.88	2.42	4.61					
Share of variance associated with first component	0.26	0.40	0.27					
Number of variables used	11	6	17					

Notes: All variable are indicators. Scoring factor is the weight attached to each variable, normalized by subtracting its mean, in the linear combination of variables comprising the 1st principal component using data of common variables pooled from KMS 1998 and KMS 2003.

**Table 3: Prediction of international and domestic migration (first-stage regression)**

	(1)		(2)	
	Number of international migrants (1998-2003)		Number of domestic migrants (1998-2003)	
<i>Instruments</i>				
Muslim household (indicator)	0.107 ***	(0.014)	-0.032 ***	(0.007)
No. of male members (19-40 years old) in 1998	0.060 ***	(0.007)	0.026 ***	(0.004)
Change in no. of male members between 1998 and 2003	0.065 ***	(0.008)	0.026 ***	(0.004)
<i>Household characteristics</i>				
At least one member has ever migrated outside Kerala as of 1998	0.039 ***	(0.010)	0.033 ***	(0.007)
Change in no. of employed members between 1998 and 2003	-0.033 ***	(0.005)	-0.009 ***	(0.002)
Number of dependents moving overseas after 1998	0.132 **	(0.052)	-0.024 **	(0.010)
Number of dependents moving within India after 1998	-0.024 *	(0.014)	0.067 **	(0.028)
Number of return migrants from overseas after 1998	-0.033 *	(0.017)	-0.003	(0.015)
Number of return migrants from within India after 1998	0.046 *	(0.026)	-0.012	(0.013)
Household size in 1998	-0.004	(0.004)	0.003 *	(0.002)
Number of household members age 25 and above in 1998..				
..who are illiterate	0.023 **	(0.012)	-0.009	(0.007)
..who are literate	-0.007	(0.014)	-0.008	(0.011)
..who have some primary schooling	-0.002	(0.015)	-0.018 **	(0.008)
..who have completed primary school	0.007	(0.010)	-0.012 *	(0.007)
..who have some secondary schooling	-0.004	(0.007)	-0.017 ***	(0.004)
..who have completed secondary school	0.014 *	(0.008)	-0.012 ***	(0.004)
..who have a post-secondary education	0.016	(0.016)	-0.022 ***	(0.007)
Male household head	0.006	(0.009)	-0.001	(0.007)
Age of household head	0.001	(0.000)	0.000 *	(0.000)
Indicator if household head in 1998 ...				
..is literate	0.015	(0.015)	-0.002	(0.019)
..has some primary schooling	0.012	(0.012)	0.037 **	(0.019)
..has completed primary school	0.024	(0.024)	0.002	(0.015)
..has some secondary schooling	0.052 **	(0.052)	0.021 *	(0.012)
..has completed secondary school	0.023	(0.023)	0.027 *	(0.015)
..has post-secondary education	0.063 *	(0.063)	0.025	(0.023)
IHST of landholdings in 1998	0.002	(0.002)	0.000	(0.002)
Observations	4,783		4,783	
	<u>Statistic</u>	<u>p-value</u>	<u>Statistic</u>	<u>p-value</u>
F-test: joint-significance of instruments	45.63	0.000	18.50	0.000

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Notes: Number of international migrants is a count of household members who migrated overseas for employment between survey rounds in 1998 and 2003. Number of domestic migrants is a count of household member who migrated to another state within India for employment between survey rounds in 1998 and 2003. First stage regressions also include a set of district-level dummies. Robust standard errors are in parentheses.

**Table 4: Impact of migration on household wealth**

	(1)	(2)	(3)
	Change in..		
	...overall assets index	...house quality index	...durable assets index
<u>Dependent variable:</u>			
<i>Panel A: OLS</i>			
Number of international migrants	0.178*** (0.056)	0.133** (0.058)	0.159*** (0.056)
Number of domestic migrants	0.128 (0.080)	0.106 (0.077)	0.123 (0.087)
<i>p-value: test of coefficient equality</i>	0.602	0.771	0.726
<i>Panel B: 2SLS</i>			
Number of international migrants	1.222*** (0.274)	1.055*** (0.270)	0.915*** (0.268)
Number of domestic migrants	1.274* (0.725)	0.554 (0.709)	2.044*** (0.745)
<i>p-value: test of coefficient equality</i>	0.953	0.571	0.211

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Notes: Number of international migrants is a count of household members who migrated overseas for employment between survey rounds in 1998 and 2003. Number of domestic migrants is a count of household members who migrated to another state within India for employment between survey rounds in 1998 and 2003. Standardized indices are constructed from first principal component weighting of a linear combination of indicators found in Table 2. Number of household observations in Panel A and B are 4,783 each. Each panel includes the following set of controls: number of dependents who moved overseas between survey rounds; number of dependents who moved within India between survey rounds; number of returning migrants between survey rounds; change in the number of employed household members in Kerala between survey rounds; whether the household had any experience with migrating from Kerala as of 1998; household size in 1998; the number of household members age 25 and over with various educational attainments in 1998; indicator for male household head; household head's age; indicators for the highest education level of the household head in 1998; IHST of landholdings in 1998 and dummies for district of residence in Kerala. Each regression is estimated with robust standard errors (in parentheses).

**Table 5: Identification tests**

	(1)		(2)	
	Change in overall assets index with number of migrants		Change in overall assets index with duration of migration	
	<u>Statistic</u>	<u>p-value</u>	<u>Statistic</u>	<u>p-value</u>
F-test of joint-significance in 1st stage regression for endogenous var. 1: overseas migrants	45.63	0.00	37.23	0.00
F-test: joint-significance in 1st stage regression for endogenous var. 2: internal migrants	18.50	0.00	16.14	0.00
Underidentification:				
Kleibergen-Paap rk LM statistic	48.20	0.00	40.85	0.00
Sanderson-Windmeijer statistic (endogenous variable 1: overseas migrants)	80.76	0.00	61.73	0.00
Sanderson-Windmeijer statistic (endogenous variable 2: internal migrants)	52.98	0.00	43.01	0.00
Weak Instrument:				
Anderson-Rubin Wald test	53.29	0.00	53.29	0.00
Stock-Wright LM S statistic	52.89	0.00	52.89	0.00
Sanderson-Windmeijer statistic F-test (endogenous variable 1: overseas migrants)	40.04	0.00	30.61	0.00
Sanderson-Windmeijer statistic F-test (endogenous variable 2: internal migrants)	26.27	0.00	21.33	0.00
Hansen J-test: Overidentification Restriction	0.01	0.94	0.00	0.96
Test for IV Redundancy:				
Muslim household (indicator)	70.63	0.00	50.14	0.00
No. of male members (19-40 years old) in 1998	105.42	0.00	63.54	0.00
Change in no. of male members between 1998 and 2003	112.20	0.00	79.43	0.00
Hausman-Wu Exogeneity Test	40.85	0.00	39.29	0.00

**Table 6: Impact of migration on household wealth - components of housing quality index**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<u>Dependent variable:</u>	<u>Change in..</u>										
	..ownership of a luxurious house	..ownership of a very good house	..ownership of a good house	..ownership of a poor house	..ownership of a mud- wall ( <i>kutch</i> ) house	..use of LPG for cooking	..use of wood for cooking	..use of kerosene for cooking	..use of electricity for cooking	..home electric- fication	..landline ownership
<i>Panel A: OLS</i>											
Number of international migrants	0.023*	0.004	0.008	-0.033*	-0.002	0.029	0.000	-0.023**	0.001	0.001	0.108***
	(0.013)	(0.025)	(0.029)	(0.018)	(0.011)	(0.025)	(0.025)	(0.010)	(0.005)	(0.015)	(0.028)
Number of domestic migrants	0.004	0.018	0.024	-0.005	-0.041*	-0.015	-0.027	0.044**	0.006	0.033	0.050
	(0.014)	(0.028)	(0.042)	(0.034)	(0.023)	(0.035)	(0.036)	(0.021)	(0.005)	(0.030)	(0.039)
<i>p-value: test of coeff. equality</i>	0.303	0.691	0.750	0.452	0.120	0.296	0.526	0.003	0.440	0.330	0.215
<i>Panel B: IV</i>											
Number of international migrants	0.051	0.187*	-0.297*	0.013	0.046	0.415***	-0.224*	-0.246***	-0.026*	-0.125	0.746***
	(0.045)	(0.105)	(0.161)	(0.118)	(0.071)	(0.123)	(0.123)	(0.066)	(0.015)	(0.105)	(0.141)
Number of domestic migrants	-0.165	-0.203	1.524***	-0.606*	-0.550**	-0.117	0.160	0.510***	0.047	0.983***	-0.286
	(0.136)	(0.299)	(0.476)	(0.332)	(0.216)	(0.327)	(0.333)	(0.180)	(0.044)	(0.308)	(0.366)
<i>p-value: test of coeff. equality</i>	0.205	0.293	0.002	0.130	0.022	0.194	0.352	0.001	0.176	0.003	0.024

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Notes: See notes to Table 4.

**Table 7: Impact of migration on household wealth - components of durable asset index**

	(1)	(2)	(3)	(4)	(5)	(6)
<u>Dependent variable:</u>	<u>Change in..</u>					
	..car ownership	...taxi or truck ownership	...scooter ownership	..television ownership	...VCR ownership	...fridge ownership
<i>Panel A: OLS</i>						
Number of international migrants	0.014 (0.014)	0.003 (0.012)	0.008 (0.022)	0.051** (0.026)	0.065*** (0.025)	0.027 (0.022)
Number of domestic migrants	0.021 (0.019)	0.005 (0.009)	0.034 (0.028)	0.033 (0.036)	0.025 (0.031)	0.009 (0.032)
<i>p-value: test of coeff. equality</i>	0.790	0.887	0.438	0.673	0.311	0.642
<i>Panel B: IV</i>						
Number of international migrants	0.053 (0.052)	0.106** (0.050)	0.267*** (0.096)	0.003 (0.136)	0.160 (0.105)	0.376*** (0.112)
Number of domestic migrants	0.078 (0.144)	0.128 (0.141)	0.490* (0.264)	1.140*** (0.380)	0.750** (0.304)	-0.214 (0.297)
<i>p-value: test of coeff. equality</i>	0.884	0.899	0.491	0.015	0.111	0.110

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Notes: See notes to Table 4.

**Appendix Table 1: Impact on household wealth by duration of migration**

	(1)	(2)	(3)
	Change in..		
Dependent variable:	...overall asset index	...house quality index	...durable asset index
<i>Panel A: OLS</i>			
Duration of international migration	0.082*** (0.023)	0.060*** (0.022)	0.076*** (0.023)
Duration of domestic migration	0.063** (0.032)	0.037 (0.030)	0.077** (0.034)
<i>p-value: test of coefficient equality</i>	0.626	0.526	0.969
<i>Panel B: 2SLS</i>			
Duration of international migration	0.545*** (0.122)	0.465*** (0.119)	0.417*** (0.120)
Duration of domestic migration	0.596* (0.336)	0.272 (0.327)	0.933*** (0.342)
<i>p-value: test of coefficient equality</i>	0.901	0.630	0.208

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Notes: Duration of international migration is the sum of time (in years) between survey rounds in 1998 and 2003 that one or more household members were working abroad. Duration of domestic migration is the sum of time (in years) between survey rounds in 1998 and 2003, that one or more household member was in another Indian state for employment. Standardized indices are constructed from first principal component weighting of a linear combination of indicators found in Table 2. Number of household observations in Panel A and B are 4,783 each. Each panel includes the following set of controls: number of dependents who moved overseas between survey rounds; number of dependents who moved within India between survey rounds; number of returning migrants between survey rounds; change in the number of employed members in Kerala between survey rounds; whether the household had experience with migrating from Kerala as of 1998, household size in 1998; the number of households members age 25 and over with various educational attainments in 1998; indicator for male household head; household head's age; indicators for the highest education level of the household head in 1998; IHST of landholdings in 1998 and dummies for district of residence in Kerala. Each regression is estimated with robust standard errors (in parentheses).

**Appendix Table 2: Impact of duration of migration on household wealth - components of housing quality index**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<u>Dependent variable:</u>	<u>Change in..</u>										
	..ownership of a luxurious house	..ownership of a very good house	..ownership of a good house	..ownership of a poor house	..ownership of a mud- wall ( <i>kutcha</i> ) house	..use of LPG for cooking	..use of wood for cooking	..use of kerosene for cooking	..use of electricity for cooking	..home electric- fication	..landline ownership
<i>Panel A: OLS</i>											
Duration of international migration	0.009*	0.009	-0.001	-0.014**	-0.003	0.014	-0.001	-0.010***	0.000	0.003	0.039***
	(0.005)	(0.009)	(0.010)	(0.006)	(0.004)	(0.009)	(0.009)	(0.003)	(0.003)	(0.005)	(0.011)
Duration of domestic migration	-0.002	0.014	0.000	-0.004	-0.008	-0.008	-0.005	0.015**	0.000	0.013	0.025*
	(0.006)	(0.012)	(0.016)	(0.013)	(0.008)	(0.013)	(0.014)	(0.008)	0.000	(0.011)	(0.014)
<i>p-value: test of coeff. equality</i>	0.154	0.736	0.975	0.490	0.634	0.154	0.772	0.002	0.869	0.391	0.455
<i>Panel B: IV</i>											
Duration of international migration	0.020	0.083*	-0.114	0.001	0.010	0.174***	-0.088*	-0.105***	-0.011*	-0.039	0.330***
	(0.019)	(0.045)	(0.071)	(0.051)	(0.032)	(0.053)	(0.053)	(0.029)	(0.006)	(0.046)	(0.063)
Duration of domestic migration	-0.069	-0.095	0.665***	-0.273*	-0.227**	-0.022	0.038	0.228***	0.022	0.413***	-0.130
	(0.060)	(0.135)	(0.216)	(0.151)	(0.098)	(0.149)	(0.151)	(0.083)	(0.020)	(0.139)	(0.172)
<i>p-value: test of coeff. equality</i>	0.230	0.279	0.003	0.132	0.042	0.287	0.495	0.001	0.165	0.006	0.029

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Notes: See notes to Appendix Table 1.

**Appendix Table 3: Impact of duration of migration on household wealth - components of durable asset index**

	(1)	(2)	(3)	(4)	(5)	(6)
<u>Dependent variable:</u>	<u>Change in..</u>					
	..car ownership	...taxi or truck ownership	...scooter ownership	..television ownership	...VCR ownership	...fridge ownership
<i>Panel A: OLS</i>						
Duration of international migration	0.004 (0.006)	0.004 (0.004)	0.008 (0.008)	0.023** (0.009)	0.032*** (0.010)	0.010 (0.008)
Duration of domestic migration	0.014* (0.008)	0.005 (0.004)	0.014 (0.011)	0.014 (0.013)	0.024** (0.012)	0.006 (0.014)
<i>p-value: test of coeff. equality</i>	0.296	0.863	0.651	0.560	0.612	0.766
<i>Panel B: IV</i>						
Duration of international migration	0.023 (0.022)	0.044** (0.021)	0.121*** (0.042)	0.016 (0.060)	0.082* (0.046)	0.156*** (0.048)
Duration of domestic migration	0.040 (0.065)	0.069 (0.065)	0.225* (0.121)	0.494*** (0.174)	0.320** (0.136)	-0.069 (0.133)
<i>p-value: test of coeff. equality</i>	0.818	0.752	0.476	0.023	0.147	0.166

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Notes: See notes to Appendix Table 1.