

Dustmann, Christian; Okatenko, Anna

**Working Paper**

## Out-migration, Wealth Constraints, and the Quality of Local Amenities

CReAM Discussion Paper Series, No. 13/13

**Provided in Cooperation with:**

Rockwool Foundation Berlin (RFBerlin)

*Suggested Citation:* Dustmann, Christian; Okatenko, Anna (2013) : Out-migration, Wealth Constraints, and the Quality of Local Amenities, CReAM Discussion Paper Series, No. 13/13, Centre for Research & Analysis of Migration (CReAM), Department of Economics, University College London, London

This Version is available at:

<https://hdl.handle.net/10419/295447>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



Centre for Research  
and Analysis  
of Migration

---

***CReAM***

Discussion Paper Series

CDP No 13/13

Out-migration, Wealth Constraints,  
and the Quality of Local Amenities

---

*Christian Dustmann and Anna Okatenko*

---

# Out-migration, Wealth Constraints, and the Quality of Local Amenities

Christian Dustmann<sup>1</sup> and Anna Okatenko<sup>2</sup>

5/24/2013

## Abstract

Using a simple theoretical model, we show that the level of migration costs relative to wealth determines the form of the relation between income and migration intentions, which can be monotonically decreasing, increasing, or inverse U-shaped. Using unique individual level data, covering three geographic regions—sub-Saharan Africa, Asia, and Latin America—we show that migration intentions do indeed respond to individual wealth, and that the patterns differ across the country groups studied in a manner compatible with the predictions of our model. Further, contentment with various dimensions of local amenities plays an important role for migration decisions.

**JEL:** O15, R23, J61

**Key words:** Migration and Wealth Constraints, Migration Intentions, Local Amenities

---

<sup>1</sup>Department of Economics, and Centre for Research and Analysis of Migration (CReAM), University College London.

<sup>2</sup>CReAM, University College London.

# 1 Introduction

Although the drivers of migration have already been studied extensively (see, e.g., the excellent survey by Hatton and Williamson, 2002),<sup>2</sup> far less is known about the role of asset constraints on migration decisions. For example, although a recent UNDP (2009) report argues that many potential migrants may be unable to finance their move, a more detailed analysis by McKenzie and Rapoport (2007) indicates that, for migrations between Mexico and the U.S. at least, individuals without assets do have a lower probability of moving but can alleviate asset constraints through networking.<sup>3</sup> In line with that observation, McDonald and Valenzuela (2012) present evidence that the poorest households in the Philippines are considerably less likely to have a family member that emigrated abroad. Similarly, Mendola's (2008) study of internal and international migration decisions in rural Bangladesh shows that, while the probability of having an internal migrant in the family decreases with household income, the probability that a family member will migrate abroad increases with it, which suggests that budget constraints may prevent poorer households from emigrating.<sup>4</sup> Studies of internal migration that use aggregate inter and intraregional population flows also emphasize the existence of budget constraints (Phan and Coxhead, 2010, for Vietnam; Golher, 2012,

---

<sup>2</sup> Most theories on bilateral migration movements emphasize “pull” and “push” factors with a particular focus on the potential increase in the value of individual human capital (Sjaastad, 1962). Nonetheless, recent empirical research also demonstrates the importance of noneconomic factors such as distance and cultural links (Belot and Hatton, 2008), language (Adsera and Pytlakova, 2012), and demographic forces and network effects (Mayda, 2010).

<sup>3</sup> See also McKenzie and Rapoport's 2010 analysis of migration networks' role in migrant selection with respect to education.

<sup>4</sup> Sharma and Zaman (2013) show that the upfront cost for an international migration is almost five times Bangladesh's per capita income.

for Brazil; Chernina et al., 2013, for the late Russian Empire, and Andrienko and Guriev, 2004, Guriev and Vakulenko, 2013, for post-Soviet Russia). On the other hand, a recent paper by Beegle et al. (2011) finds no evidence that household wealth restricts migration in Tanzania, whereas Abramitzky et al. (2012) find a negative relationship between wealth and the probability of both internal and international migration in the analysis of historical mass migration from Norway to the US.

In this paper, we address how asset limitations may impact migration, a relation that we argue is far from clear cut. That is, although an increase in wealth may augment the migration possibilities of asset constrained individuals, it may simultaneously decrease the migration propensity of households with no wealth restrictions by raising their opportunity costs. As a result, the relation between wealth and migration may differ across countries depending on the distribution of wealth and migration costs.

Because recent empirical research demonstrates that income considerations are not the only factor impacting migration decisions, our analysis also incorporates noneconomic factors. In particular, we control for individuals' overall contentment with local amenities like public services, security, or governance—factors shown by the literature on residential sorting and hedonic equilibrium to be of considerable value (Bayer et al., 2011). We show that in any analysis of the relation between wealth and migration, the way that contentment with local amenities is distributed across populations may be important not only in its own right but also for its potential impact on this relation.

We first develop a simple theoretical model that describes migration decisions when migration is costly and migration decisions depend on current wealth and contentment with local amenities. We then simulate this model to show that the level of migration costs relative to wealth determines the form of the relation between wealth and migration intentions. For the population of individuals in an emigration country, this relation can be monotonically

decreasing, increasing, or inverse U-shaped,<sup>5</sup> meaning that the relation between wealth and migration may take different forms in different countries dependent on the location of the wealth distribution and migration cost. We also show that the propensity to migrate monotonically decreases with the level of contentment with the current location.

Our main contribution, however, is empirical evidence on the relation between individual migration propensities and individual assets, which bears out our model's predictions. We base this analysis on a unique data set, the Gallup World Poll (GWP), which is available for a large set of developing countries and contains information on individuals' intentions to move away from the area of current residence over the next 12 months. The data thus allow us to investigate both international and internal movements. The GWP also provides a wealth of information on individuals' assessments of different aspects of their current situation, including security, local services, institutions, and governance, as well as detailed information on household possessions and assets. This information enables the construction of an index on individual wealth and socioeconomic status, as well as measures of contentment with the local situation along various dimensions.

Not only does this data set facilitate comparison of the relation between wealth and migration propensities across (groups of) countries, it allows us to capture domestic migrations for which few statistics exist. That is, although international migration rates are reasonably well estimated from national censuses and World Bank surveys (see Docquier and Marfouk, 2006), figures on internal migrations are scarce and cannot be constructed from available data (see Bell and Muhidin, 2009, for a discussion). Yet such an omission may be

---

<sup>5</sup> There is indeed some evidence at the macro level for an inverse U-shaped relation between wealth and migration (see, e.g., de Haas, 2009; Hatton and Williamson, 2002). Such evidence is supported by the findings that emigration rates from poor and rich countries are lower than those from countries with moderate levels of development and that these rates tend to first increase and then decrease with development level (UNDP, 2009).

quite serious: whereas the number of international migrants estimated for 2010 totaled 214 million (United Nations, 2012), the number of internal migrants estimated for 2000 was over three times greater, perhaps as many as 740 million (see UNDP, 2009).

A further advantage of measuring intentions to migrate within the next 12 months instead of actual migrations is that it provides an assessment of the migration propensities for a representative set of individuals in each of the countries studied. A potential disadvantage, on the other hand, is that many of these planned migrations may not materialize. However, as Manski (1990) points out, survey responses on intentions represent merely best-point predictions of respondents' future behavior conditional on information known at the time of the survey. Manski thus stresses that the divergence between stated intentions and future realized behavior stems from the additional information received by the respondent after the intentions have been stated. The formation of intentions is thus important in its own right: analyses of migration intentions may lead to a better understanding of migrant selection by identifying subpopulations that consider migration as a possible future action.

Our empirical analysis focuses on three sets of relatively homogeneous countries: developing nations in sub-Saharan Africa, Asia, and Latin America. These countries differ, however, in level of economic development: the average GDP at purchasing power parity per capita in sub-Saharan countries is about half that in Asia and four times less than that in Latin America. These differences accord with the wealth indicator distributions that we construct from the GWP data for use in our analysis.

Our findings conform remarkably to the predictions of our simple model: whereas migration probabilities decrease in Latin America (the richest region), they increase with the individual wealth index in Africa and Asia. The association between migration intentions and various dimensions of local amenities (e.g., contentment with public services, security), however, is negative for all regions. Finally, to assess how important wealth considerations

are for migration plans relative to contentment with amenities in the current area of residence, we decompose the overall explained variation in migration plans by the different channels. We find that contentment with various dimensions of local amenities is a far more important factor in shaping migration decisions than household wealth, a finding in line with Cai et al.’s (2013) evidence that subjective well-being is a better predictor of emigration intentions than household income quintiles.

Our paper speaks to the literature on reasons for migrations (see Hanson, 2010, for a review), although rather than emphasizing the “push” and “pull” factors of migrations, as does most of that research stream, we focus on the moving costs that may impede migration moves. In addition, unlike most existing papers, which rely on aggregate data (see, e.g., Clark et al., 2007) or consider bilateral movements (see, e.g., Mayda, 2010; Belot and Hatton, 2008), we use micro level data and examine the variation across individuals for a large number of countries.

Our paper also relates to the few papers that discuss the possibility that budget restrictions may constrain migration movement (McKenzie and Rapoport, 2007; Abramitzky et al., 2012; Sharma and Zaman, 2013). However, whereas these papers consider just one country and focus on international out-migrations, we illustrate the relation between wealth and migration plans regardless of destination for a large number of countries. We also analyze migration plans in conjunction with individual assessments of current location quality and the political and security situation in the original region of residence. Our work thus complements these existing studies by introducing a broader perspective that captures all (not just international) movements and incorporates a large array of subjective factors that drive migration plans. In addition, by emphasizing that the relation between wealth and migration plans depends on the overall wealth level of the country (i.e., the location of the wealth distribution) and may interact with other amenities, we offer a structure that can reconcile the differences in

findings between previous papers (e.g. McKenzie and Rapoport, 2007; Beegle et al., 2011; Abramitzky et al., 2012) with respect to the wealth-migration relation.

Our paper also relates to a small but growing body of literature on migration intentions, much of which pertains only to countries of the Western world or Central and Eastern Europe. In fact, some such studies investigate migration intentions in only one country (e.g., Uebelmesser, 2006, and van den Berg and Weynandt, 2012, for Germany; Epstein and Gang, 2006, for Hungary; Papapanagos and Sanfey, 2001, for Albania), although others do draw on data for several countries to compare migration plans across them (Fouarge and Ester, 2007; Drinkwater and Ingram, 2009). The precise questions asked to measure migration intentions, however, vary greatly between studies, which makes comparison extremely difficult. Nevertheless, certain consistencies do emerge. For example, most studies find that the willingness to move is higher for males and singles and decreases with age. Likewise, the impact of education and income on migration intentions is well documented to be nonlinear, usually explainable by differences in migration costs by education level and relative inequality at home and in the destination (Burda et al., 1998; Liebig and Sousa-Poza, 2004). Noneconomic factors also play an important role in shaping migration intentions. For instance, Lam (2002) shows that a lack of political confidence in the home country's institutions increases emigration propensity even when the income abroad is expected to be lower. Conversely, violence in the destination country makes potential movers abandon their emigration plans (Friebel et al., 2011). We are able to investigate these associations for a large number of countries based on individual responses to identical questions on future migration plans. At the same time, by drawing on a far larger set of questions than most previous analyses, we can also highlight the important role of satisfaction with local amenities, public services and security in shaping intentions to move.

The remainder of the paper is organized as follows. Section 2 outlines our theoretical framework. Section 3 provides more details on our data and estimation strategy. Section 4 reports our estimates on the impact of wealth and contentment with the current situation on the intention to migrate (4.1) and the results of using the theoretical model outlined in Section 2 to explore the impact of a country’s characteristics on its average migration costs (4.3). Section 5 concludes.

## 2 Theoretical Framework

We start with a simple model in which migration plans are formed on the basis of current wealth<sup>6</sup> and the individual’s overall contentment with current place of residence, a variable that our data make measurable. Because migration is costly and individuals are credit constrained, individuals below a certain wealth threshold are unable to migrate. Hence, in our model, individual migration probabilities increase or decrease with current wealth, depending on the magnitude of migration costs (see McKenzie and Rapoport, 2007, for similar formulation).

### *The Model.*

We denote variables related to current place of residence and potential destination using the subscripts  $h$  (home) and  $d$  (destination), respectively. The welfare of an individual in either location depends on wealth  $y$  and contentment with amenities offered in that location,  $s$ . These latter may include security, public services, institutions, and governance. We then

---

<sup>6</sup> In the model, we prefer to use the term “wealth” instead of “income”, because individuals may finance migration not only from current income but also using assets or borrowing against future income. “Wealth” should be regarded as a measure of overall earning and borrowing capacity rather than assets that individuals possess.

denote nonmeasurable factors that affect an individual's welfare in either destination by the random variable  $\epsilon_k$ , so that welfare in location  $k$  is given by

$$u_k = y_k + s_k + \epsilon_k, k \in [h, d].$$

Here, the individual decides to move if (expected) welfare in the destination is larger than that at home,  $u_d > u_h$ , subject to the constraint that current wealth should exceed migration costs,  $c$ :  $y_h \geq c$ . Otherwise, if  $y_h < c$ , no migration takes place even if the potential utility in the destination exceeds utility at home. We assume that migration cost comprises two components,  $c = \bar{c}(X, Z) + \zeta$ , where  $\bar{c}$  represents average migration costs in a given population, whose level is determined by country characteristics  $Z$  (e.g., geography, state of infrastructure, security) and individual sociodemographic characteristics  $X$  (e.g., gender, age, education,). The additional constituent  $\zeta$  is a random individual component accounting for other factors that are unobservable but still affect the cost of migration (e.g., individual preferences, taste for location, borrowing opportunities). The probability of a (planned) migration is then given by

$$\Pr(M = 1) = \Pr(y_h \geq c; u_d > u_h), \quad (1)$$

where  $M$  is an indicator equal to 1 if the individual intends to migrate and 0 otherwise. Individuals who do not wish to move are thus of two types: those unable to finance migration and those who believe that their utility is higher in the region of current residence than in an alternative destination. It therefore follows that

$$\Pr(M = 0) = \Pr(y_h < c) + \Pr(y_h \geq c; u_d \leq u_h). \quad (2)$$

This framework implies that the impact of current wealth on the intention to move is ambiguous. On the one hand, increasing current wealth tends to remove the budget constraint in financing migrations, thereby increasing the propensity to migrate. On the other hand, higher wealth in the current place of residence also means foregoing better opportunities in

the current location, which decreases migrations. The model also predicts that people who are less satisfied with the area in which they live or who expect more amenities in the destination (because of either higher income or better local conditions) are more likely to move.

*Simulations.*

We simulate the model to illustrate the role of migration costs in the theoretical and empirical relations between the propensity to migrate and current wealth. Because this exercise focuses on  $y_h$ , we assume  $s_h$ ,  $y_d$  and  $s_d$  to be unobserved (which is usually the case in practice) and introduce the aggregate unobservable component  $\xi = u_d - s_h - \epsilon_h$ . The relation between the probability of intending to migrate and current wealth is then given by  $\Pr(M = 1|y_h) = 1 - \Pr(\xi < y_h)$  in the absence of migration costs and by  $\Pr(M = 1|y_h) = [1 - \Pr(\xi < y_h)] \Pr(\zeta < y_h - \bar{c})$  in the constrained case, assuming that  $\xi$  is uncorrelated with the individual unobserved taste shifters  $\zeta$ .

We simulate  $y_h$  by drawing observations from the empirical cumulative distribution of current wealth in sub-Saharan Africa,<sup>7</sup> later used as a wealth index in our empirical analysis. Although this index does not measure absolute levels of wealth, it does provide a ranking of individuals by wealth on a scale from 0 to 1. The simulated variable  $y_h$  is also scaled between 0 and 1 and has a right skewed distribution with median 0.34, mean 0.39, and standard deviation 0.24. The unobservables  $\xi$  are assumed to be normally distributed with mean 0.4

---

<sup>7</sup> See Section 3 on the construction of the wealth measure from the GWP data on household possessions. The percentiles of the distribution of this wealth index in sub-Saharan Africa define the distribution from which we simulate  $y_h$  (see Figure 3 for the respective density plot). Denoting the  $k$ -th percentile by  $p_k$ , where  $k = 0, \dots, 99$ , the percentiles divide the support of the wealth index into 100 segments  $[p_k, p_{k+1}]$ . An observation on  $y_h$  is then generated by making two draws from the standard uniform distribution,  $u_1$  and  $u_2$ . The first defines the segment from which the observation of  $y_h$  will be generated:  $[p_l, p_{l+1}]$  such that  $l \leq 100 u_1 < l + 1$ ; the second is used to make a linear interpolation between  $p_l$  and  $p_{l+1}$ :  $y_h = p_l + u_2(p_{l+1} - p_l)$

and standard deviation 1, which implies that the expected average gains from migration equal the average wealth in the given population.

To ensure that the level of migration costs is represented *relative* to wealth, the average migration costs  $\bar{c}$  are also scaled between 0 and 1, meaning that  $\bar{c}$  could also be interpreted as the wealth threshold above which an individual can finance migration costs from current wealth. We consider four scenarios, which differ in the relative costs of migration: Scenario 1 represents the unconstrained case, (1)  $c = 0$ , while Scenarios 2–4 differ in the magnitude of the average migration costs  $\bar{c}$ : (2)  $\bar{c} = 0$ , which corresponds to the individual being on average unconstrained; (3)  $\bar{c} = 0.25$ , representing average migration costs that are medium level but still lower than the average wealth; and (4)  $\bar{c} = 0.45$ , designating high costs above the average wealth. In all scenarios, the unobserved individual specific cost component  $\zeta$  is assumed to be normally distributed with mean 0 and standard deviation 0.3, which implies that even in the case of zero average migration costs, there are individuals who cannot afford to move. We then construct an indicator variable  $M$ , which is equal to 1 if  $y_h \geq \bar{c} + \zeta$  and  $\xi > y_h$  (i.e., the individual can cover migration costs and is made better off by moving) and 0 otherwise. In the unconstrained case, the first inequality is obsolete.<sup>8</sup>

[Figure 1 about here]

Panel A of Figure 1 plots the probability of choosing to migrate conditional on current wealth (which is the conditional expectation function of the indicator  $M$ ) under the four scenarios described above. Here, the unconstrained case is represented by a solid line, which

---

<sup>8</sup> Because it is the cost of migration relative to wealth that matters for the migration decision, these scenarios can be seen as representing countries with different overall wealth; thus, the unconstrained case is a country whose location of wealth distribution is such that migration costs will never be a binding constraint for any migration.

clearly illustrates that the propensity to migrate decreases almost linearly with current wealth. Because migration costs do not affect decisions to migrate under this scenario, the benefit of migrating decreases with the individual's own wealth in the current place of residence.<sup>9</sup> The findings for the other three scenarios, in contrast, are particularly interesting. If migration is costly, the relation between wealth and the propensity to migrate becomes nonlinear because of a disproportionate decrease in migrations at the bottom of the wealth distribution—where the budget constraint is more binding—and an increase in opportunity costs when moving up the wealth distribution. It is clear from the figures that the curvature and location of the relation between migration plans and wealth depend on migration costs relative to wealth. The higher the ratio, the more individuals at the bottom of the wealth distribution cannot afford to move, and the more deviated the constrained relation from the unconstrained one.

We then examine what the estimated wealth-migration relation would be if the data for wealth and migrations were generated by the model developed above using regression models. For the same four scenarios, Panel B of Figure 1 shows regression lines obtained by regressing the migration-intentions indicator  $M$  on  $y_h$  and its square using data simulated from our model and then predicting the propensity of migrating along the entire support of  $y_h$ .

As the figure shows, in Scenario 1, where migration costs are not binding (corresponding to a situation in which the distribution of wealth is shifted enough to the right that migration costs do not bind), migration intentions decrease with current wealth, and the sample regression line slopes downward. In the cases with low and medium-level migration costs, this relation turns into an inverse-U shape because the budget constraint is binding mainly for the poorest individuals, whereas those with middle incomes are free to move and choose to migrate more

---

<sup>9</sup> We assume here that potential migrants have the same income possibilities in the destination, no matter their place in the current wealth distribution. Qualitative results will be the same even if those further up the current income distribution rank more highly in the destination income distribution.

often than the wealthiest. If migration costs are high relative to current wealth, however, as in the last scenario (where  $\bar{c} = 0.45$ ), the budget constraint is binding for a considerable proportion of individuals in the middle of the wealth distribution, and the majority of moves occur at the top of the distribution. The sample regression then does not fully capture the nonlinearity of the theoretical relation and the resulting estimated relation between the migration propensity and current wealth is strictly positive.

Our simple model<sup>10</sup> thus highlights that the relation between an individual's current wealth and propensity to migrate can eventually take any form depending on the level of migration costs relative to income.<sup>11</sup> This observation provides a basic and general explanation for discrepancies in estimated income-migration profiles across the different studies discussed above. Next, therefore, we use migration intention data from the GWP to estimate the relation between these intentions and household wealth for three groups of countries that differ in wealth distribution and thus the relative costs of migration.

---

<sup>10</sup> Relaxing model parametric assumptions (e.g., adding a nonadditive nonlinear relation between income, local amenities, and utility; changing the distribution of unobservables) does not change the basic intuition about the role of budget constraints in the propensity to migrate.

<sup>11</sup> According to our model, migration propensities also depend on the distribution of potential gains from migration,  $\xi$ , and on the variance of the random component of migration costs,  $\zeta$ . For instance, higher expected gains from migration lead to higher migration propensities along the entire support of the wealth distribution. In turn, a larger variance of  $\zeta$  allows more people at the bottom of the wealth distribution to cover migration costs while hindering the movements of people at the top. It therefore results in a flatter wealth-migration profile. It does not, however, lead to an inverse U-shape of the theoretical and empirical relation between wealth and migration; rather, in our model, the only factor that can generate such an inverse-U shape is the ratio of average migration costs to wealth.

### 3 Data, Sample, and Descriptive Statistics

Our empirical analysis is based on the first wave of the GWP (2005–2006), a survey conducted in 129 countries with the goal of interviewing 1,000 respondents in each country. Only in a few very small or very large countries are the target sample sizes smaller or larger, respectively. Respondents are at least 15 years old, and most country samples are probability based (i.e., with weights applied that are also used throughout this paper) and nationally representative of the resident population aged 15 years and older. Although certain areas in some countries could not be covered because of safety concerns, these regions account for less than 10% of the total target sample population (for more details on the GWP, see Appendix A.1). We complement these data with national statistics collected by the World Bank (2011). In our analysis, we focus on three regions—sub-Saharan Africa, Latin America, and Asia—but must exclude certain countries for which migration intention data are unavailable (see Table 1 for the countries included in each of the three regional groups). We also exclude rich Asian countries like Singapore, South Korea, and Taiwan, as well as Hong Kong, in spite of data availability because our research focus is on developing countries.

[Table 1 about here]

*Migration intentions.* Our main variable of interest is measured based on responses to the following question: “In the next 12 months, are you likely or unlikely to move away from the city or area where you live?” The possible answers are “likely to move,” “unlikely to move,” “don’t know,” and “refused to answer.” The way the question is formulated suggests that the response “likely to move” indicates a strong inclination to migrate in that migration is rarely spontaneous and the relatively short time frame of 12 months should prevent those with only a vague inclination to move from responding affirmatively. Likewise, the use of the phrase “likely to move” rather than “willing to move,” “considering a move,” or similar wording

should also help identify individuals with developed migration plans. Finally, it should be noted that the question on migration plans in the GWP data is formulated in such a way that it relates to movements both across and within national borders with no constraint imposed on the distance of the move. Nor does it distinguish between whether the intended move will be permanent or temporary. We may expect that the majority of migration plans reported in the GWP refer to internal movements, given that internal population flows are much larger than international ones (UNDP, 2009).

Overall, 19% of respondents in Asia and Latin America and 29% in sub-Saharan Africa reported being likely to move away from their current residence area over the next 12 months.<sup>12</sup> In Table 1, we list the countries with the lowest and highest average propensities to migrate in the three regions under study, together with the average propensities to move by region calculated from the countries with available data.<sup>13,14</sup> The figures reported in this table clearly indicate considerable cross-country differences. They are relatively high compared to existing statistics on actual migrations, reflecting the fact that whereas the GWP question on migration plans is phrased so that any intention to migrate will be counted regardless of distance and duration, official statistics fail to capture all movements. For further discussion on the correspondence between intentions data and actual migration flows, see Appendix A.2.

---

<sup>12</sup> Response frequencies are detailed in Table A-2 of Appendix A-5.

<sup>13</sup> We drop respondents that refused to answer the question on migration intentions, which is 0.17% of the overall sample.

<sup>14</sup> In calculating the regional averages, we weight the average propensities to migrate for each country by its population of individuals 15 years of age or older. We use World Bank country population data on the total population  $P_j^{total}$  (number of inhabitants) and the shares of the population between the ages of 15 and 64 ( $s_j^{15-64}$ ) and 65 and above ( $s_j^{>64}$ ), both measured in % of total in 2005. The sample weight for country  $j$ ,  $w_j$ ,

$$\text{is thus given by } w_j = \frac{s_j^{15-64} + s_j^{>64}}{100} P_j^{total}.$$

[Figure 2 about here]

To obtain an initial idea of how migration propensities are related to wealth for each of the three country groups considered, in Figure 2, we plot the mean migration intentions (by country) against 2005 GDP at purchasing power parity per capita, measured in thousands of international dollars. The first graph in the upper left corner of the figure pools all 98 countries for which the GWP provides information on migration intentions. The other three panels correspond to the three groups of countries that are the focus of this paper,<sup>15</sup> which differ in terms of GDP per capita. Specifically, at purchasing power parity, the mean GDP per capita of the countries considered in this paper is 2,034 international dollars in Africa, 3,788 in Asia, and 7,467 in Latin America. Figure 2 clearly shows that migration intentions tend to decrease with GDP per capita overall; however, at the regional (and thus more homogeneous) level, migration intentions increase with GDP per capita in poorer Africa and Asia but decrease with GDP/capita in more developed Latin America. These figures thus point to income levels having a nonlinear association not only with international emigration rates, as documented in the existing literature (for an overview, see UNDP, 2009), but also with overall migration intentions, both internationally and internally.

*Demographics.* Table 2 displays the descriptive statistics for the individuals in our sample, distinguishing between the three groups of countries under study.<sup>16</sup> The Table reports

---

<sup>15</sup> To enhance readability of the African graph, we drop the South Africa and Botswana data because they show a GDP at purchasing power parity per capita of 8,597 and 11,772 international dollars, a whole order of magnitude higher than the median. Doing so, however, does not change the slope of the prediction line, which remains positive with and without omission of the two outliers.

<sup>16</sup> The weights provided in the GWP make the samples representative at the country level. Hence, because our analysis is performed at a more aggregate level (by regional grouping of a number of countries), we construct weights that represent the importance of observations for that particular group of countries;

the number of countries for which the respective information is available, retaining only observations between 15 and 75 years of age. According to the table, the most striking differences between the three regional samples are in educational attainment and area type. Whereas only 33.7% of the Latin American sample fall into the "low" education category, this number increases to 63.4% and 59.7% in the Asian and sub-Saharan samples, respectively.<sup>17</sup> Latin Americans are also the most likely to have completed at least four years of tertiary education (12.8%), while only 2.2% of Africans have reached this level. In Africa, people live predominantly in rural areas or small towns (more than 80% of the sample), while in Latin America they live more often in large cities or suburbs (60%). The Asian sample represents an intermediary case, with 78% living in a rural area or village and 22% being city dwellers.<sup>18</sup> The African sample is also the youngest, with an average age of 34 years, compared to 37 years in Latin America and 41 years in Asia.

[Table 2 about here]

*Wealth measures.* In the GWP, household income is reported for less than half the countries in which the migration question is asked. However, even when this information is available, it is likely to be of low quality for less developed countries and may thus say little

---

specifically,  $w_i^{rg} = w_i w_j$ , where  $w_i$  is the individual weight provided by GWP and  $w_j$  is the country population 15 years of age and older (see footnote 6 for details on the latter). These weights  $w^{rg}$  are used throughout the remainder of the paper.

<sup>17</sup> The descriptive statistics for the Asian sample are strongly influenced by Chinese observations because of China's weight in the regional population. For instance, the Chinese educational structure is quite different from that of the other countries in the Asian subsample: in the Chinese sample, 71.6% of respondents have up to 8 years of schooling and 24.7% have 9–11 years of schooling versus 41.2% and 51.0%, respectively, in the other Asian countries.

<sup>18</sup> If China is excluded from these statistics, the respective figures become 68% and 32%.

about the individual wealth that is an important factor restricting migration. We therefore follow Kolenikov and Angeles (2009) and construct our wealth measure using data on household ownership of durable consumer goods and housing quality. In essence, this method assumes that the observed ordinal variables are underlain by unobserved, continuous, normally distributed variables whose correlation matrix can be decomposed using principal component analysis (PCA). The first principal component is then used as an aggregate index (see Appendix A.3 for a more detailed description of this approach and Table A-3 for the list of questions included in our wealth index construction). The choice of retained variables by region is dictated by balancing the number of variables and the number of observations in the estimation sample, because variables may be missing for some countries. The first components for the 10 variables retained for sub-Saharan countries, the 9 for Asian, and the 7 for Latin American explain slightly more than 50% of the total variance of retained variables in all three regions. We scale these first components to lie between 0 and 1.

[Figure 3 about here]

The regional distributions and descriptive statistics for the resulting wealth measures are outlined in Figure 3 and Table 3, respectively. For Asia and Latin America, the index is similarly distributed, with more weight on relatively high incomes and a mean around 0.6, while for Africa, the index is shifted to the left, with a high density at low wealth levels (and a mean of 0.38).

*Contentment with current amenities.* Next, we construct a measure of respondents' contentment with their living situations and amenities in their current location using the same polychoric PCA procedure as described above. Table A-4 lists the survey questions used to gather respondents' opinions on public services available in the residence area, such as transportation systems, schools, and water quality. The first principal components explain

about 40% of all variation in these variables for all three groups of countries. The means and quartiles of the resulting contentment indices are shown in Table 3. Respondents in sub-Saharan Africa report the lowest levels of satisfaction with areas of residence (with an average satisfaction index of 0.57), while Asians are the most satisfied with their localities (average satisfaction of 0.69). The distribution of this index is quite similar for the three groups of countries analyzed, with the African distributions shifted slightly to the left.

Using the same approach, we construct two further indices of contentment with local amenities relating to security and the country's institutions, as well as an index of contentment with individual's living standard. The index relating to security is constructed using three questions related to property crimes and direct criminal offences against the individual (see Table A-5 for details). Security varies quite considerably across the three country groups: for instance, whereas in the Asian sample, only 8.2% of respondents report a member of their household having had money or property stolen within the past 12 months and only 2.7% report a family member having been assaulted or mugged, in sub-Saharan Africa, the respective numbers are 22.5% and 12.6%. The index on living standards is based on three questions related to satisfaction with the housing and goods that the respondents can afford (see Table A-6 for the precise wording of the questions). It explains around 70% of the variance for the three country groups. The index on quality of a country's institutions is based on questions measuring individuals' confidence in the country's government, judicial system, banks, media, and so forth. As in the case of the wealth measure, the number of variables used varies across regions dependent on data availability, from 6 in the Asian sample to 11 in the Latin American one (see Table A-7 for details).

[Table 3 about here]

Finally, because beliefs about future developments and changes from the past to the present factor into the dynamics of migration decisions, we construct two variables that captures individual perceptions of the *change* in a country's overall situation. We base these variables on three survey questions asking respondents to rate the country's current situation compared to five years ago and the expected situation five years into the future (see Tables A-8 and A-9 for the questions). From this information, we construct two measures: individual perceptions of the current situation compared to that five years ago and individual expectations for the situation in five years compared to that today. Clearly, a strong belief about deterioration should result in individuals being more willing to migrate, whereas a strong improvement, compared to the past, should have a negative influence on migration propensities.

The overall distributional statistics for these different indices are reported in Table 3. In general, the level of contentment with amenities is lower for the African sample, while the levels for the Asian and Latin American samples are similarly distributed. For instance, Africa has a lower mean and a higher variance than Asia on the security index. On the other hand, the average confidence in the country's institutions is lowest in Latin America: 0.46 on a 0 to 1 scale compared to 0.56 and 0.63 for the African and Asian samples, respectively. In terms of the country's current situation compared to the past the responses are most optimistic in Asia and most pessimistic in Africa. The same pattern is observed when individuals are asked about expected improvements over the next five years, with index values of 0.62 for Asia, 0.59 for Latin America, and 0.54 for Africa.

## 4 Empirical Analysis

To estimate how emigration intentions away from the current area of residence over the next 12 months relate to wealth (measured by the index described above) and to the set of amenity

measures discussed in the previous section, we estimate linear probability models of the following type:<sup>19</sup>

$$M_{ij} = \alpha + X_{ij}\beta + \gamma_1 W_{ij} + \gamma_2 W_{ij}^2 + S_{ij}\delta + \theta_j + \epsilon_{ij}, \quad (3)$$

where  $M_{ij}$  is an indicator variable equal to 1 if individual  $i$  in country  $j$  believes that a migration over the next 12 months is likely,  $X_{ij}$  are observable individual characteristics,  $W_{ij}$  is a wealth index,  $S_{ij}$  is a vector of contentment with local amenities (discussed above),  $\theta_j$  is country fixed effect, and  $\epsilon_{ij}$  are unobservables. We estimate equation (3) separately for each group of countries, and all our regressions condition on observed demographic characteristics such as age and education.

## 4.1 Migration Intentions, Wealth, and Local Amenities

Table 4 summarizes the marginal effects of the regressors for the most general specification,<sup>20</sup> which for the wealth measure, integrated into the model in squared form, are calculated at the regional sample means. Columns 1–3 report the marginal effects; columns 4–6 show the impact of a one standard deviation change in each of these indices on migration intention. An increase in the wealth index at the mean increases migration intention for Asia and sub-Saharan Africa, but its effect is slightly negative and insignificant for Latin America. A one standard deviation increase in the index (again evaluated at the mean and specific to

---

<sup>19</sup> Nonlinear models, such as probit or logit models, give very similar results.

<sup>20</sup> Detailed estimates of the underlying regressions are given in Tables A-10, A-11, and A-12 which present the results for each of the three country groups and for different specifications. These results clearly show that omitting the indices on contentment with the local amenities leads to lower estimates of the wealth coefficients.

each of the three regions) increases the probability that an individual intends to emigrate by 3.2 (5) percentage points in Asia (Africa).

[Table 4 about here]

To illustrate the impact of wealth along the wealth distribution for each of the three regions, in Figure 4, we plot the predicted migration propensities along the entire distribution of the wealth index for both the absolute index values (panel A) and the percentiles of the index distribution (panel B). Panel A thus shows the within-region evolutions of migration propensities along the wealth index. However, because the wealth indices are differently distributed across regions, these values are not directly comparable. Hence, in panel B, we plot the migration propensities along the *percentiles* of the wealth index, which allows comparison of the migration intentions of individuals located at the same relative position in the respective region's wealth distribution. These figures are computed at the *regional* sample means of all other variables in both panels and the respective parameter estimates, which, as discussed below, explain locational differences.

[Figure 4 about here]

As the figures illustrate, the association between wealth and migration intention varies widely across regions. More specifically, the likelihood of an intention to move increases with the wealth index in Africa and Asia but decreases slightly in Latin America, with similar patterns both along the index itself (panel A) and along the percentiles of the index distributions (panel B). Given that our model predicts a positive slope for the wealth-migration profile when migration costs are high relative to current wealth but a possible negative slope when costs are relatively low, the regression results clearly point to the presence of budget constraints restricting migration of the relatively poor in Asia and sub-Saharan Africa. Such restrictions, however, seem to be less important in Latin America,

where migration intentions tend to decrease with wealth (albeit with a statistically insignificant negative slope). The results therefore fit well with the simulations in Figure 1, in which the Asian and sub-Saharan African regions correspond to a scenario with high migration costs relative to the wealth distribution, while the Latin American regions corresponds to a scenario in which migration costs seem not to restrict migration. They are also in line with the sizeable differences in the distribution of the wealth index between Asia and sub-Saharan Africa, on the one hand, and Latin America, on the other (see Figure 3), and with the GDP differences between these regions (as discussed in Section 3).

Panel B of Figure 4 also enables comparison of individuals with the same position on the regional wealth distribution across the three different groups of countries.<sup>21</sup> The figure shows that, although the benefits from moving are far higher in sub-Saharan Africa, the poor in Latin America (the first 20 percentiles of the wealth distribution) have a higher propensity to migrate than the poor in Africa, who, according to our model, are constrained by budget. In Asia, on the other hand, we observe a steep increase in migration propensity with wealth in the first decile of the wealth distribution, which reflects the severe constraint that migration costs impose on migration below the 20th percentile of the wealth distribution. Above the 20th percentile, the profile continues to increase, but with a smaller slope. For the African region, the profile is steep over much of the wealth distribution, suggesting that migration costs are a severe constraint throughout. This finding is very much in line with the far lower

---

<sup>21</sup> As shown in Table A-3, the survey questions used to construct the wealth measure vary across regional samples, depending on data availability. The same is true for the other two indices measuring satisfaction with local public services and confidence in the country institutions. Nevertheless, when we test our results by using the same sets of variables to construct the indicators for all three regions using the same samples as in the main analysis, they remain essentially the same. We find a positive relationship between wealth and the intention to migrate in sub-Saharan Africa and Asia and a slightly negative, though nonsignificant, slope in the Latin American sample.

average per capita GDP in Africa, as well as the location of the wealth distribution shown in Figure 3 above.

### *Migration Intentions and Local Amenities*

Table 4 also reports the results for the various measures of contentment with local amenities—specifically, satisfaction with personal standard of living, local public services, and security—all of which have a strong and significant impact on migration intentions for all three regions.<sup>22</sup> Overall, the magnitude of the impact of a one standard deviation increase in each of these measures is nearly as large as (and sometimes even larger than) the magnitude of the impact of a one standard deviation increase in wealth for Asia and sub-Saharan Africa and far larger for Latin America, where the wealth constraint seems not to be binding. The most striking case is sub-Saharan Africa, where individuals located at the extreme ends of the contentment with local public services distribution show a 40 percentage point difference in their likelihood to move within the next 12 months. In the Asian and Latin American samples, this difference, although smaller, is still substantial at 11 and 17 percentage points, respectively. Likewise, area safety turns out to be an important factor for migration decisions, with migration intentions decreasing by 2–3 percentage points in response to a one standard deviation increase in this index. Satisfaction with personal living standard has approximately the same impact on intention to move in all three regions (migration intentions decrease by 3 percentage points in response to a one standard deviation increase in this index), whereas local public services and security seem to play a larger role in sub-Saharan Africa. There, when the index of satisfaction with local public services increases by one standard deviation, migration propensity falls by 10.7%, twice as large a drop as in Latin America and thrice as large as in Asia (we discuss this issue further below).

---

<sup>22</sup> Adding higher order polynomials into these amenity measures barely changes the slopes at the mean.

Also interesting is the relation between migration intention and perceived past and expected future changes in the country of origin's situation. Not only do we find a weak relation between migration intention and these individual beliefs, but the quality of a country's institutions seems to matter less for migration decisions in Asia and sub-Saharan Africa. We do, however, find a highly significant association between migration intention and institutional quality for Latin America: a one standard deviation increase in the index is associated with a 2.2 percentage point increase in the probability of an intention to migrate over the next 12 months.

### *Decomposing the Level Differences*

Another interesting feature is that the African wealth-migration profile is located far above the Asian and Latin American profiles (see Figure 4), which could be attributable to either the cross-regional differences in observable characteristics (particularly the amenity indicators) or the regression coefficients, which reflect the weights that individuals in different regions attach to these amenity measures. In Table 5, we decompose the overall gap by first distinguishing between the “explained” components (those due to differences in the observables) and the “unexplained” components (those due to differences in the coefficients on the predictors) for three comparative country pairs.<sup>23</sup> We also decompose the explained

---

<sup>23</sup> We calculate this division as follows: Given two groups (regions in our context) 1 and 2,  $\bar{Y}_1$  and  $\bar{Y}_2$  denote the group mean outcomes,  $\bar{X}_1$  and  $\bar{X}_2$  the group mean predictors, and  $\beta_1$  and  $\beta_2$  the least-square estimates obtained separately from the two group-specific samples (country fixed effects excluded). Let  $\beta^*$  be the least-square estimate obtained from a pooled regression over two groups including a group indicator as an additional covariate. Then the difference between the group mean outcomes can be presented as a sum of two components:

$$\bar{Y}_1 - \bar{Y}_2 = (\bar{X}_1 - \bar{X}_2)' \beta^* + (\bar{X}_1 (\beta_1 - \beta^*) + \bar{X}_2 (\beta^* - \beta_2)),$$

portion further into the contributing wealth factors (e.g., wealth and satisfaction with living standard), local area characteristics (contentment with local public services and area security), and opinions about the home country (perceived past and expected future change in a country's situation and opinion on a country's institutions).

[Table 5 about here]

As Table 5 shows, the group-mean differences in these different variables explain about 20–30 percent of the overall difference in location profiles. For instance, the average migration propensity is 13 percentage points higher for the sub-Saharan sample than for the Asian sample, 2.7 percentage points of which are due to differences in covariates. In fact, the detailed contributions of the sets of covariates indicate that if people in sub-Saharan Africa had, on average, the same values of the wealth index as in Asia, their predicted migration intentions would be even higher, by 3.4 percentage points (because of a relaxation in the credit constraint). At the same time, the average propensity to move in the sub-Saharan sample would be 4.0 percentage points lower if contentment with local amenities were at the level observed for Asia. Similarly, the difference in covariates explains 2.1 of the 7.2 percentage point differences in migration intention between sub-Saharan Africa and Latin America. Again, we find that migration propensities in sub-Saharan Africa would be higher (by 2 percentage points) if the average wealth index was the same as that for Latin America. Conversely, migration propensities would be lower for sub-Saharan Africa if the satisfaction with living standards and the local area were the same as for Latin America. Most of the

---

where the first term on the right-hand side is the part of the outcome differential explained by group differences in the predictors, and the second term is the unexplained part measuring the contribution of differences in the coefficients, including differences in the intercept. For more details, see Jann (2008).

differences in migration propensity between regions, however, remain unexplained and thus attributable to differences in the coefficients and unobservables.

### *Decomposition of the Explained Variance*

One way to assess the relative importance of these different factors in determining migration plans is to decompose their explanatory contribution to the overall explained variation of the regression (the  $R^2$ ). To do so, as suggested by Shorrocks (2012), we use a Shapley-based decomposition of the full model  $R^2$  (column 6 in Tables A-10 to A-12) relative to a model that controls only for demographic characteristics and country fixed effects.<sup>24</sup> The decomposition results are reported in Table 6, which distinguishes between three groups of factors: (i) wealth/living standard, (ii) amenities related to the local residence area, and (iii) amenities related to the country overall. We find that wealth makes a sizeable contribution to the explained variance in migration intention only in the Asian sample (27% of the total gain). In Latin America and especially in sub-Saharan Africa, respondents' satisfaction with their current area of residence is the most important determinant in explaining variation in the desire to move, explaining 56% and 71%, respectively, of the total explained variation in migration intention. In Asia, contentment with the area of residence has about the same weight in the migration decision as household wealth-related factors.

[Table 6 about here]

Overall, our results illustrate that, on the one hand, wealth plays an important role for migration decisions: there is strong evidence, for example, that, particularly in poorer regions

---

<sup>24</sup> See Appendix A.4 for details.

and at lower parts of the wealth distribution, poverty severely restrains individual's migration plans. On the other hand, the results also emphasize the importance of local amenities in shaping these intention and decisions. Whereas wealth and living standard together are clearly important, safety and satisfaction with local amenities and public services plays an equally important role in Asia and may be even more important in Latin America and Africa.

### **4.3 Estimating the ratio of migration costs relative to wealth**

One important and interesting question raised by the findings is the extent to which the wealth threshold  $c$ , below which individuals are constrained from pursuing migration, depends on local area and individual characteristics. For instance, it could well be that the cost of migrating varies regionally, depending on infrastructure and travel possibilities, or that these costs differ by gender. Likewise, individuals of different ages might engage in different types of migrations (e.g., young individuals moving alone; older individuals moving with their families) or choose different types of moving arrangements (e.g., older individuals taking more possessions than the young). All these possibilities would lead to variations in the level of migration cost relative to wealth above which migration is possible.

In principle, and based on the model derived in Section 2, the wealth threshold and its dependence on observable characteristics could be calculated by estimating the structural model implied by equations (1) and (2). However, doing so would require measures of utility and current income at home ( $u_h$  and  $y_h$ ), as well as utility at the desired destination  $u_d$ , information that is usually either totally unobserved (such as  $u_d$ ) or only partially observed in the data. Nevertheless, in the belief that structural estimation may still provide some interesting insights into the heterogeneity of migration constraints, we here propose a possible estimation strategy, which we illustrate using data for sub-Saharan Africa.

For this estimation, we treat the utility in the desired destination,  $u_d$ , as an unobservable random variable that is normally distributed with mean 0 and standard deviation 1. We then proxy the utility at the current location,  $u_h$ , using responses to questions on life satisfaction today and five years previously.<sup>25</sup> The proxy for the current utility is then the first principal component constructed from these two questions, normalized to lie between -0.5 and 0.5.

First, we assume that the wealth threshold above which migration is possible, introduced in Section 2, changes with demographic ( $X$ ) and country ( $Z$ ) characteristics and unobservables  $\zeta$ :  $c = X\beta + Z\gamma + \zeta$ . Our econometric model explaining the likelihood to migrate is then

$$\begin{aligned} \Pr(M = 1) &= \Pr(u_d > u_h; \zeta < y_h - X\beta - Z\gamma) \\ \Pr(M = 0) &= 1 - \Pr(M = 1) \end{aligned} \quad (4)$$

with

$$(u_d, \zeta) \sim N(0, \Sigma); \quad \Sigma = \begin{pmatrix} 1 & \sigma_{u_d\zeta} \\ \sigma_{u_d\zeta} & \sigma_\zeta^2 \end{pmatrix}.$$

It should be noted that the coefficient on current wealth,  $y_h$ , is equal to 1. In addition, because  $y_h$  is scaled between 0 and 1 (see Section 3), we also normalize the average wealth threshold,  $\bar{c} = X\beta + Z\gamma$ , to lie between 0 and 1.

We estimate this model using the maximum likelihood method. We include gender and age in  $X$ ; to account for both country geography and its level of economic development,  $Z$

---

<sup>25</sup> The exact wording of these questions is as follows: “Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. Suppose we say that the top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time (you stood 5 years ago), assuming that the higher the step, the better you feel about your life, and the lower the step, the worse you feel about it? Which step comes closest to the way you feel? ”

includes GDP per capita, total land surface, population density, agricultural land per capita, and road density. Model identification depends on the variability of the current wealth index,  $y_h$ .

Table 7 shows the impact of a one unit increase and a one standard deviation increase in the explanatory variables on the wealth threshold  $\bar{c}$ , evaluated at the regional sample means of all other variables. We find that the wealth threshold above which migration becomes an option is higher for females and older people: at the sample mean (34 years), a one-year increase in age increases the average wealth threshold by 0.02 points, while a one-standard deviation increase (15 years) increases the average income threshold by 0.42. The wealth threshold is estimated to be lower when the country has more arable land, roads, and a denser population, which seems logical. The negative coefficient on total land area is harder to justify, as longer distances could be expected to make migrations costlier. One possible explanation might be that people living in small countries engage more often in international migrations that are more expensive than internal movements.

[Table 7 about here]

We find a weak relation between country economic development and the average level of migration costs relative to wealth  $\bar{c}$ . The predicted profile of  $\bar{c}$  along the entire support of GDP per capita (from 605 international dollars for Niger to 11,772 for Botswana) shows that  $\bar{c}$  first decreases then remains flat only to increase again at GDP/capita above 6K.<sup>26</sup>

---

<sup>26</sup> As stressed in the theoretical discussion, we do not expect  $\bar{c}$  to decrease monotonically with country wealth because the reasons underlying migration vary with country development levels. For instance, the motivation to escape famine in a poor African state differs greatly from that driving urban-to-urban migration in a relatively well-off Latin American country. Hence, we can expect that in a relatively developed country, there will be features that make migration easier, from a better transportation system and established financial institutions to a more widespread use of modern communication technologies that

## 5 Conclusion

This paper investigates how wealth constraints can severely restrict individual migration, particularly at the low end of the wealth distribution, an important question for assessing the migration intensities induced by wealth creation in some of the world's poorest areas. As a first step, we develop a simple model that illustrates the dual role of wealth in the decision to migrate: on the one hand, it alleviates budget constraints; on the other, the further up the wealth distribution an individual is situated, the more it decreases the relative gains from migration. The model simulations demonstrate that even such a simple model can generate any relation between migration and wealth dependent on the level of migration cost relative to the wealth distribution. In particular, the model predicts that for very poor countries, where the wealth constraint is most likely to be binding, migrations will increase along the wealth distribution, but the opposite may be the case for richer countries.

Our empirical analysis is based on a unique and as yet little explored data source, the Gallup World Poll, which asks individuals in a large number of countries about their migration intentions and provides information that enables the construction of indices on individual wealth and contentment with local amenities. Our analytical results are remarkably in line with our model predictions: whereas migration intentions increase along the wealth distribution in sub-Saharan Africa and Asia, they are not much affected by wealth in the richest region, Latin America. Through the lens of our model, this finding is compatible with the interpretation that wealth constraints are not binding in the latter region but are binding in the former two.

---

allow migrants to stay in contact with their families. Nevertheless, certain reasons for migration in the least developed places will disappear with development; for example, exposure to famine or sending a family member away to diversify earnings.

We also find that contentment with local amenities like security and public services is very important for migration intentions in all the regions considered, but particularly so in sub-Saharan Africa. This observation suggests that the quality of local amenities—including such varied components as security, public services, transport infrastructure, and housing—are a very important channel through which migration plans are affected.

Taken together, these findings have important policy implications. Relaxing wealth constraints through economic development in the poorest countries, such as many nations in sub-Saharan Africa, will allow more individuals to cover migration costs, which may lead to more migration. On the other hand, improving local amenities, such as local infrastructure, public services, and safety conditions, could be a powerful tool to prevent people from moving away from their local area. Thus, to relieve migration pressure on developed nations, development policies should aim not only at enhancing wealth, but also at providing local infrastructures, public services, and security.

## References

Abramitzky, Ran, Leah Platt Boustan, and Katherine Eriksson, “Have the Poor Always Been Less Likely to Migrate? Evidence from Inheritance Practices during the Age of Mass Migration”, NBER Working Paper No. 18298 (2012), forthcoming in *Journal of Development Economics*.

Adsera, Alicia and Mariola Pytlikova, *The role of language in shaping international migration* NORFACE Migration Discussion Paper No. 2012-14 (2012).

Andrienko, Yuri and Sergei Guriev, “Determinants of interregional mobility in Russia: Evidence from panel data”, *Economics of Transition* 12(1) (2004), 1-27.

Bayer, Patrick, Robert McMillan, Alvin Murphy, and Christopher Timmins, “A Dynamic Model of Demand for Houses and Neighborhoods”, NBER Working Paper No. 17250 (2011).

Beegle, Kathleen, Joachim de Weerdt, and Stefan Dercon, “Migration and Economic Mobility in Tanzania: Evidence from a Tracking Survey,” *The Review of Economics and Statistics* 93(3) (2011), 1010–1033.

Bell, Martin and Salut Muhidin, “Cross-National Comparison of Internal Migration”, Human Development Research Paper No. 2009/30 (2009).

Belot, Michele and Timothy J. Hatton, “Immigrant Selection in the OECD”, CEPR Discussion Paper No. 6675 (2008).

Burda1998 Burda, Michael C., Wolfgang Härdle, Marlene Müller, and Axel Werwatz, “Semiparametric Analysis of German East-West Migration Intentions: Facts and Theory,” *Journal of Applied Econometrics* 13(5) (1998), 525–541.

Cai, Ruohong, Neli Esipova, Michael Oppenheimer, and Shuaizhang Feng, “International Migration Desires Related to Subjective Well-Being,” mimeo (2013).

Chernina, Eugenia, Paul C. Dower, and Andrei Markevich, “Property Rights, Land Liquidity and Internal Migration”, *Journal of Development Economics* (2013) forthcoming.

Clark, Ximena, Timothy J. Hatton, and Jeffrey G. Williamson, “Explaining U.S. Immigration, 1971-1998,” *The Review of Economics and Statistics* 89(2) (2007), 359–373.

de Haas, Hein, “Mobility and Human Development”, Human Development Research Paper No. 2009/01 (2009).

Docquier, Frederic and Abdeslam Marfouk, “International Migration by Education Attainment, 1990-2000,” in Caglar Ozden and Maurice Schiff, eds., *International Migration, Remittances and the Brain Drain*, a copublication of The World Bank and Palgrave Macmillan (2006), 151–199.

Drinkwater, Stephen and Peter Ingram, “How Different are the British in their Willingness to Move? Evidence from International Social Survey Data,” *Regional Studies* 43(2) (2009), 287–303.

Epstein, Gil S. and Ira N. Gang, “The Influence of Others on Migration Plans,” *Review of Development Economics* 10(4) (2006), 652–665.

Filmer, Deon and Lant H. Pritchett, “Estimating Wealth Effects without Expenditure Data – or Tears: An Application to Education Enrollments in States of India,” *Demography* 38(1) (2001), 115–132.

Fouarge, Didier and Peter Ester, “Factors determining international and regional migration in Europe”, European Foundation for the Improvement of Living and Working Conditions (2007).

Friebel, Guido, Juan Miguel Gallego, and Mariapia Mendola, “Xenophobic Attacks, Migration Intentions and Networks: Evidence from the South of Africa”, IZA Discussion Paper No. 5920 (2011).

Golgher, Andre B., “The Selectivity of Migration and Poverty Traps in Rural Brazil”, *Population Review* 51(1) (2012), 9-27.

Guriev Sergei and Elena Vakulenko, “Internal Migration and Interregional Convergence in Russia”, (2013), available at SSRN: <http://ssrn.com/abstract=2200539>.

Hanson, Gordon H., “International Migration and the Developing World,” in Dani Rodrik and Mark Rosenzweig, eds., *Handbook of Development Economics*, Vol. 5, Elsevier B.V., (2010), 4363–4414.

Hatton, Timothy J. and Jeffrey G. Williamson, “What Fundamentals Drive World Migration?”, NBER Working Paper No. 9159 (2002).

Israeli, Osnat, “A Shapley-based decomposition of the R-Square of a linear regression,” *The Journal of Economic Inequality* 5(2) (2007), 199–212.

Jann, Ben, “The Blinder-Oaxaca decomposition for linear regression models,” *The Stata Journal* 8(4) (2008), 453–479.

Kolenikov, Stanislav and Gustavo Angeles, “Socioeconomic Status Measurement with Discrete Proxy Variables: Is Principal Component Analysis a Reliable Answer?”, *Review of Income and Wealth* 55(1) (2009), 128–165.

Lam, Kit-Chun, “Interaction between Economic and Political Factors in the Migration Decision,” *Journal of Comparative Economics* 30(3) (2002), 488–504.

Liebig, Thomas and Alfonso Sousa-Poza, “Migration, Self-Selection and Income Inequality: An International Analysis,” *Kyklos* 57(1) (2004), 125–146.

Manski, Charles F., “The Use of Intentions Data to Predict Behavior: A Best-Case Analysis,” *Journal of the American Statistical Association* 85(412) (1990), 934–940.

Mayda, Anna Maria, “International migration: a panel data analysis of the determinants of bilateral flows,” *Journal of Population Economics* 23(4) (2010), 1249–1274.

McDonald, James Ted and Rebecca Valenzuela, “Why Filipino Migrants Remit? Evidence from a Home-Host Country Matched Sample”, mimeo (2012).

McKenzie, David and Hillel Rapoport, “Network effects and the dynamics of migration and inequality: Theory and evidence from mexico,” *Journal of Development Economics* 84(1) (2007), 1–24.

McKenzie, David and Hillel Rapoport, “Self-Selection Patterns in Mexico-U.S. Migration: The Role of Migration Networks,” *The Review of Economics and Statistics* 92(4) (2010), 811–821.

Mendola, Mariapia, “Migration and technological change in rural households: Complements or Substitutes? ,” *Journal of Development Economics* 85(1-2) (2008), 150–175.

Papapanagos, Harry and Peter Sanfey, “Intention to emigrate in transition countries: the case of Albania,” *Journal of Population Economics* 14(3) (2001), 491–504.

Phan, Diep and Ian Coxhead, “Inter-provincial migration and inequality during Vietnam’s transition,” *Journal of Development Economics* 91(1) (2010), 100-112.

Sharma, Manohar and Hassan Zaman, “Who Migrates Overseas and Is It Worth Their While? An Assessment of Household Survey Data from Bangladesh,” *The Journal of Developing Areas* 47(1) (2013), 281–302.

Shorrocks, Anthony F., “Decomposition procedures for distributional analysis: a unified framework based on the Shapley value,” forthcoming in *The Journal of Economic Inequality* (2012).

Sjaastad, Larry A., “The Costs and Returns of Human Migration,” *Journal of Political Economy* 70(5) (1962), 80–93.

Uebelmesser, Silke, “To Go or Not to Go: Emigration from Germany,” *German Economic Review* 7(2) (2006), 211–231.

UNDP, *Human Development Report 2009. Overcoming barriers: Human mobility and development*. (Palgrave Macmillan for United Nations Development Programme, 2009).

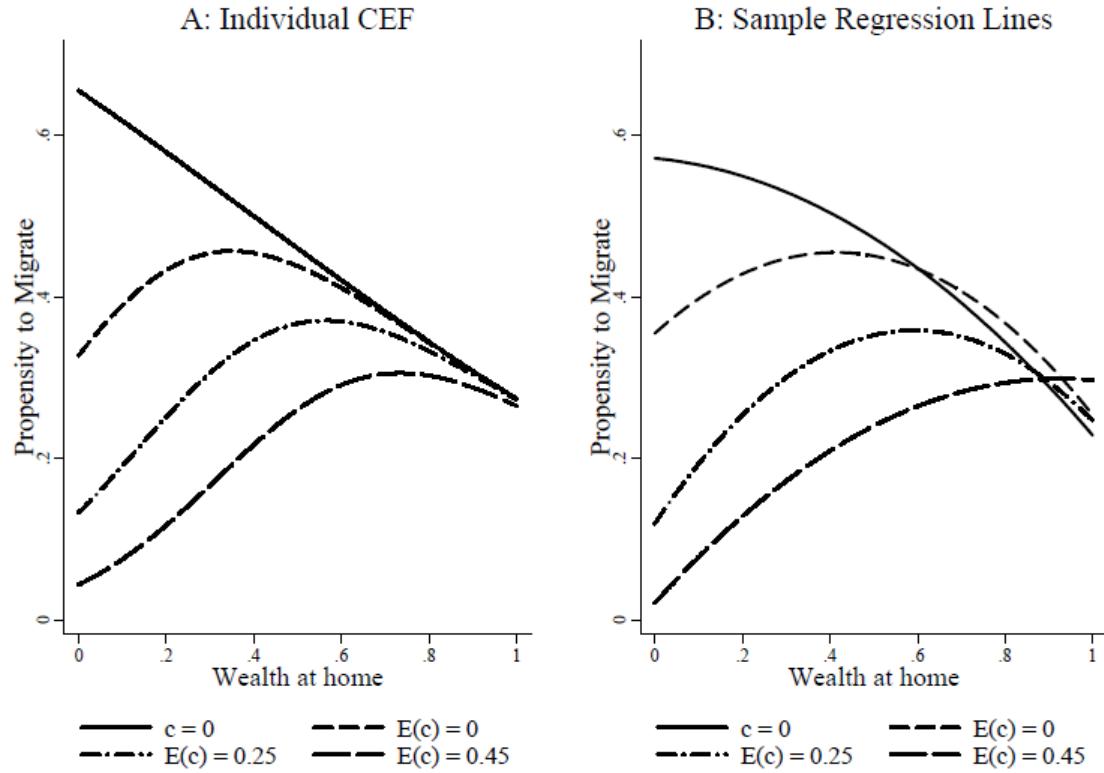
United Nations, “*International Migrant Stock: The 2008 Revision*”.  
<http://esa.un.org/migration/index.asp?panel=1>. Accessed: March 2012.

van den Berg, Gerard J. and Michèle A. Weynandt, “Explaining Differences between the Expected and Actual Duration Until Return Migration: Economic Changes”, SOEP paper No. 497 (2012). Available at SSRN: <http://ssrn.com/abstract=2172696>.

World Bank, “*World Bank Data Catalog*”. <http://data.worldbank.org/>. Accessed: July 2011.

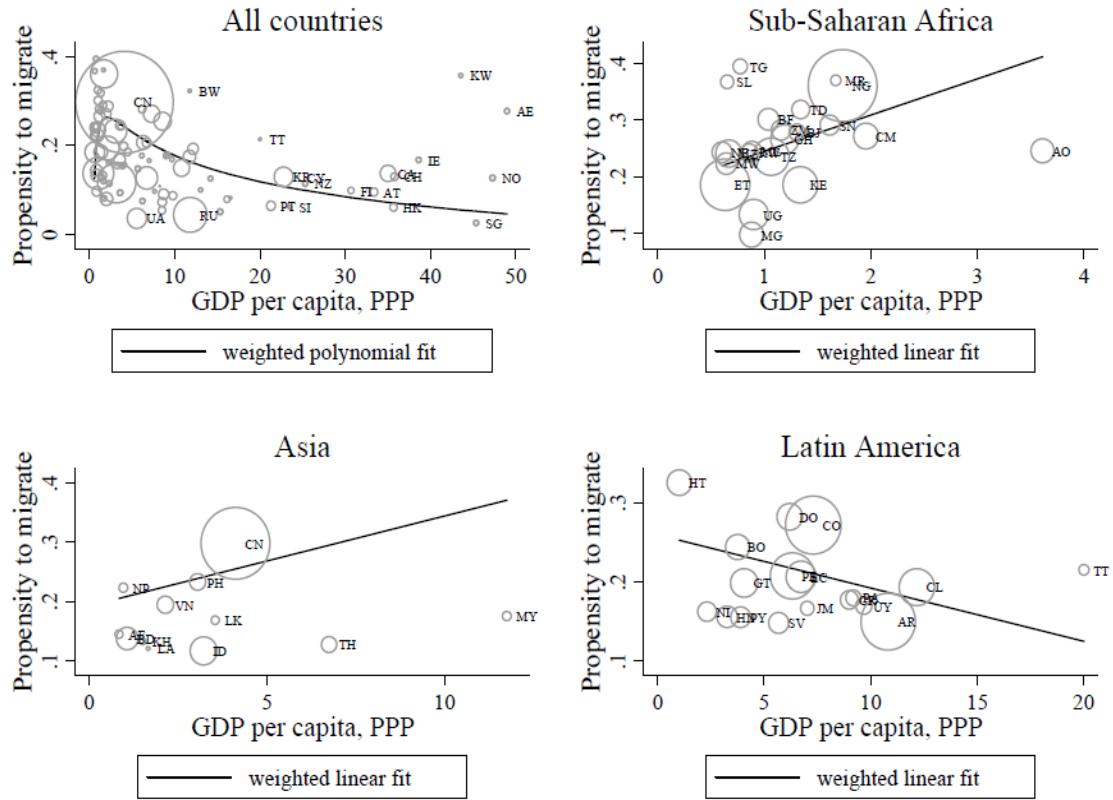
## Figures

Figure 1: Propensity to migrate and migration costs



*Note:* Author calculations from a simulation of the theoretical model exposed in Section 2, in which an indicator of migration intentions is generated equal to 1 if an individual's utility in destination is higher than utility at home and the individual is able to cover migration costs out of her current income, and equal to 0 otherwise. Panel A pictures theoretical relation between the probability to migrate and individual wealth at different levels of migration costs denoted by  $c$ . Panel B plots respective regression lines obtained by regressing the migration-intentions indicator on income.

Figure 2: Average migration intentions and GDP at purchasing power parity per capita



*Note:* All 98 countries for which information on migration intentions is available in the Gallup World Poll are plotted in the pooled graph. Two outliers, South Africa and Botswana, are omitted from the African graph; however, this omission does not affect the slope of the prediction line. Country populations 15 years of age or older are used as weights and define the size of the circle. The GDP and population data are for 2005 and stem from the online World Bank database. Average national propensity to migrate is calculated using the Gallup World Poll 2005–2006. Country codes are as in ISO 3166 “Codes for the representation of names of countries and their subdivisions.”

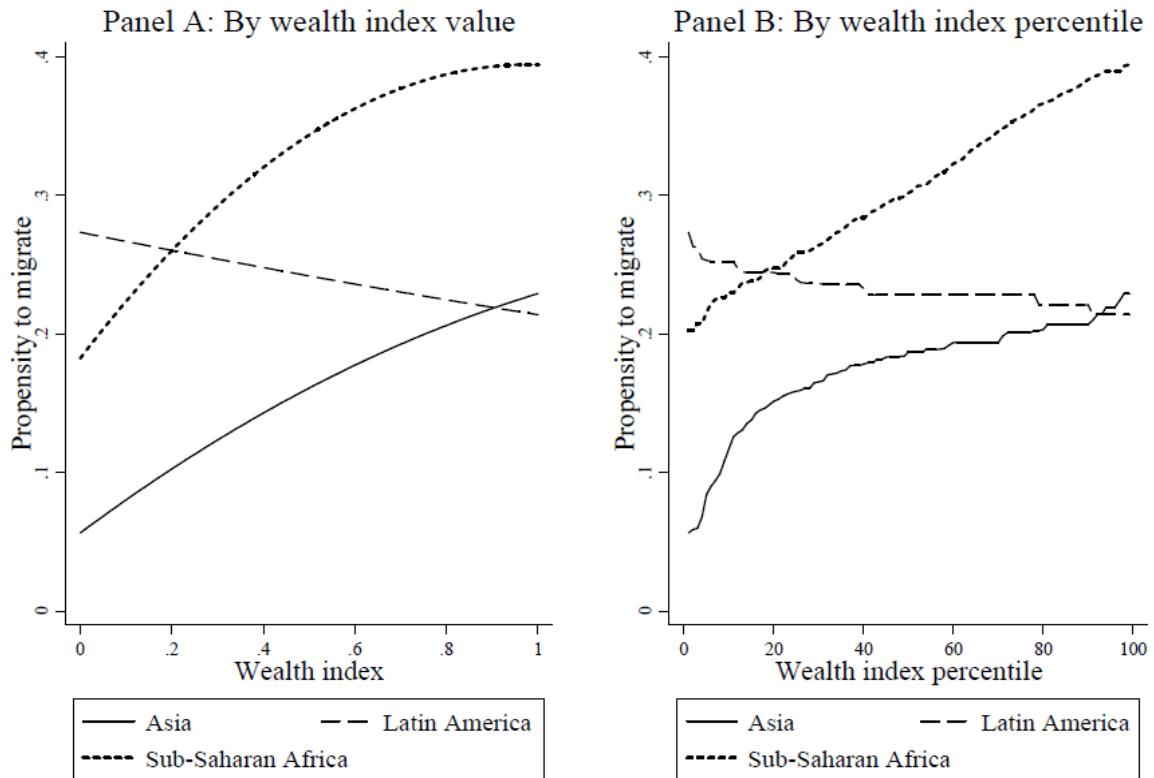
Figure 3: Distributions of the wealth index, by region



*Note:* The wealth index is constructed from survey questions on household possessions and housing quality using polychoric principal component analysis (Kolenikov and Angeles, 2009). See Appendix A.3 and Table A-3 for details.

*Source:* Author calculations from the Gallup World Poll 2005–2006.

Figure 4: Predicted propensity to migrate along the wealth index support



*Note:* The wealth measure scaled between 0 and 1 is constructed from survey questions on household possessions and housing quality using polychoric principal component analysis (Kolenikov and Angeles, 2009); see Appendix A.3 and Table A-3 for details. The figure plots the predicted propensity to migrate, evaluated at the sample mean of all other variables, along the whole support and against the percentiles of this index. Predictions are calculated using the estimates from the OLS regression of the migration-intentions indicator on the full set of controls (specification 6 in Tables A-10, A-11, and A-12).

*Source:* Author calculations from the Gallup World Poll 2005–2006.

## Tables

Table 1: Percentage of respondents reporting a likelihood of moving away from the city or area of residence over the next 12 months, by region

Region	Countries with available data	Mean	Min	Max
Asia	Afghanistan, Bangladesh, Cambodia, China <sup>b</sup> , Indonesia <sup>a</sup> , Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam	24.81%	11.65%	29.77%
Latin America and the Caribbean	Argentina, Bolivia, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador <sup>a</sup> , Guatemala, Haiti <sup>b</sup> , Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Trinidad and Tobago, Uruguay	20.60%	14.77%	32.49%
Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Cameroon, Chad, Ethiopia, Ghana, Kenya, Madagascar <sup>a</sup> , Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo <sup>b</sup> , Uganda, Zambia, Zimbabwe	26.25%	9.73%	39.50%

*Note:* National propensity to migrate averages are calculated using sample weights; regional averages are weighted using country populations 15 years of age or older. If China is excluded, the average migration propensity in the Asian sample reduces to 15.36%, with the Philippines having the highest propensity to migrate at 23.28%.

<sup>a</sup>Country with the lowest average propensity to migrate.

<sup>b</sup>Country with the highest average propensity to migrate.

*Source:* Author calculations from the Gallup World Poll 2005–2006 using 2005 World Bank population data for country weights in the regional averages.

Table 2: Sample demographic characteristics

Variable	Asia		Latin America		Sub-Saharan Africa	
	Countries	Mean	Countries	Mean	Countries	Mean
Male	13	0.487	20	0.488	25	0.494
Age (in years)	13	40.61	20	37.01	25	34.13
Single/never been married		0.298		0.364		0.377
Married/has a partner	12	0.646	20	0.520	19	0.519
Widowed/divorced/separated		0.056		0.116		0.103
Less than high school (up to 8 years)		0.634		0.337		0.597
High school (9-11 years)	7	0.319	11	0.535	19	0.381
College (12 years or more)		0.048		0.128		0.022
Number of adults in the household	8	3.525	0	—	4	3.925
Number of children in the household	13	1.077	18	1.426	0	—
Rural area or on a farm		0.531		0.082		0.373
In a small town or village	9	0.251	18	0.318	2	0.460
In a large city		0.165		0.503		0.114
In the suburb of a large city		0.053		0.097		0.053

*Note:* Sample weights are applied in the estimation. Because of missing information for some countries in the GWP, the table lists the number of countries with available data.

*Source:* Author calculations from the Gallup World Poll 2005-2006 using 2005 World Bank population data for country weights in the regional averages.

Table 3: Distributions of the constructed indices

Index	Asia				Latin America				Sub-Saharan Africa			
	Q1	Q2	Q3	Mean	Q1	Q2	Q3	Mean	Q1	Q2	Q3	Mean
Wealth index	0.491	0.661	0.759	0.604	0.473	0.737	0.737	0.659	0.195	0.328	0.551	0.380
Contentment with local public services	0.496	0.737	0.898	0.685	0.497	0.689	0.85	0.658	0.371	0.597	0.79	0.573
Area security	0.854	1	1	0.919	0.809	0.809	1	0.779	0.62	0.806	1	0.778
Contentment with personal living standard	0.469	0.786	1	0.687	0.461	0.797	1	0.69	0.158	0.463	0.842	0.509
Confidence in the	0.43	0.645	0.87	0.634	0.262	0.438	0.647	0.464	0.315	0.559	0.791	0.555
Perception of the current situation compared to that	0.449	0.501	0.6	0.521	0.355	0.49	0.597	0.47	0.349	0.45	0.549	0.428
Expectations for the country's situation in five	0.5	0.634	0.74	0.615	0.432	0.588	0.72	0.562	0.413	0.543	0.685	0.535

*Note:* Sample weights are applied in the estimation.

*Source:* Author calculations from the Gallup World Poll 2005–2006 using 2005 World Bank population data for country weights in the regional averages.

Table 4: Marginal effects and effects of a one standard deviation change calculated from an OLS regression.

Variables	Marginal effects			Effect of 1 SE change		
	Asia	Latin America	Sub-Saharan Africa	Asia	Latin America	Sub-Saharan Africa
Male	0.008 (0.015)	0.026** (0.013)	0.022 (0.014)			
Age/10	-0.031*** (0.005)	-0.037*** (0.004)	-0.043*** (0.005)			
Wealth index <sup>a</sup>	0.158*** (0.049)	-0.057 (0.039)	0.262*** (0.044)	0.032** (0.015)	-0.012 (0.011)	0.050*** (0.010)
Contentment with personal living standard	-0.082*** (0.028)	-0.102*** (0.023)	-0.085*** (0.025)	-0.028*** (0.009)	-0.032*** (0.007)	-0.031*** (0.009)
Contentment with local public services	-0.111*** (0.038)	-0.172*** (0.032)	-0.397*** (0.036)	-0.028*** (0.010)	-0.041*** (0.008)	-0.107*** (0.010)
Area security	-0.107** (0.045)	-0.099*** (0.025)	-0.113*** (0.027)	-0.020** (0.009)	-0.027*** (0.007)	-0.030*** (0.007)
Perception of the current situation compared to that five years ago	-0.153* (0.082)	-0.044 (0.053)	0.076 (0.076)	-0.023* (0.012)	-0.008 (0.009)	0.012 (0.012)
Expectations for the country's situation in five years compared to that today	0.088 (0.068)	0.060 (0.047)	0.050 (0.063)	0.015 (0.012)	0.013 (0.010)	0.009 (0.011)
Confidence in the country's institutions	0.016 (0.029)	0.089*** (0.030)	0.024 (0.030)	0.004 (0.008)	0.022*** (0.008)	0.007 (0.009)

Note: The dependent variable is an indicator for the likelihood of moving away from the current place of residence over the next 12 months. All models control for country fixed effects. Sample weights are applied in the estimation. Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

<sup>a</sup> At the regional sample mean.

Table 5: Decomposition of the average gap in migration intentions between regions

	Asia vs Sub-Saharan Africa	Latin America vs Sub-Saharan Africa	Asia vs Latin America
Total gap	-0.130 *** (0.011)	-0.072 *** (0.010)	-0.058 *** (0.010)
Unexplained	-0.103 *** (0.012)	-0.051 *** (0.012)	-0.041 *** (0.011)
Total explained	-0.027 *** (0.006)	-0.021 *** (0.007)	-0.017 *** (0.006)
Explained by wealth	0.034 *** (0.005)	0.020 *** (0.006)	-0.004 ** (0.002)
Explained by contentment with personal living standard	-0.008 *** (0.003)	-0.013 *** (0.003)	0.002 ** (0.001)
Explained by demographic characteristics	-0.007 *** (0.002)	-0.010 *** (0.002)	0.002 (0.001)
Explained by contentment with local amenities and area security	-0.040 *** (0.004)	-0.017 *** (0.003)	-0.023 *** (0.004)
Explained by opinions about the country and country institutions	-0.007 ** (0.003)	-0.001 (0.003)	0.006 (0.005)

*Note:* The decomposition is shown from the viewpoint of the second group. The explained component measures the expected change in the second group's average propensity to move if it had the first group's predictor levels. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 6: Relative contribution of explanatory variables to the OLS regression R-square.

Factor	Asia	Latin America	Sub-Saharan Africa
Wealth index	27.08%	6.36%	9.27%
Satisfaction with personal living standard	20.11%	31.07%	15.13%
<i>Subtotal: wealth factors</i>	<i>47.19%</i>	<i>37.43%</i>	<i>24.40%</i>
Contentment with the local public services	25.45%	34.72%	62.43%
Area security	15.81%	21.28%	8.13%
<i>Subtotal: residence area factors</i>	<i>41.26%</i>	<i>56.00%</i>	<i>70.56%</i>
Perceptions of the change in a country's overall situation	10.03%	1.84%	1.36%
Confidence in the country institutions	1.53%	4.73%	3.69%
<i>Subtotal: country factors</i>	<i>11.56%</i>	<i>6.57%</i>	<i>5.04%</i>
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

*Note:* The dependent variable is an indicator for the likelihood of moving away from the current place of residence over the next 12 months. The table shows the contributions of explanatory variables to the gain in the R-square in the full model (specification 6 in Tables through A-10 to A-12) in comparison to a linear regression of migration intentions on gender, age, and country fixed effects. The gain in the R-square between two specifications is decomposed using the Shapley approach (Shorrocks, 2011).

Table 7: Average marginal effects of gender, age, and country characteristics on the wealth threshold above which individuals could afford migration,  $\bar{c}$

Variable	(1)		(2)	
	1 unit	1 SD	1 unit	1 SD
Male <sup>a</sup>	-0.161*		-0.174	
	(0.096)		(0.113)	
Age	0.026***	0.475***	0.028***	0.347***
	(0.008)	(0.089)	(0.005)	(0.065)
Arable land (hectares per person)	-0.213**	-0.072**	-0.419***	-0.105***
	(0.107)	(0.035)	(0.136)	(0.036)
Road density (km of road per sq. km of land area)	-0.223**	-0.074**	-0.450***	-0.076***
	(0.114)	(0.031)	(0.132)	(0.027)
Population density (hundred of people per sq. km of land area)	-0.187**	-0.141***	-0.289***	-0.183***
	(0.079)	(0.050)	(0.058)	(0.041)
Land area (mln. sq. km)	-0.127***	-0.057**	-0.158	-0.057
	(0.048)	(0.026)	(0.098)	(0.041)
GDP per capita, PPP (constant 2005 international 1000\$)	-0.056	-0.067	-0.105	-0.092*
	(0.039)	(0.070)	(0.071)	(0.048)
$\sigma_{\zeta}^2$		0.919***		0.750***
		(0.190)		(0.148)
$\sigma_{\zeta}$		0.959***		0.866***
		(0.099)		(0.086)
Correlation of unobservables ( $\sigma_{u_d\zeta}/\sigma_{\zeta}$ )		-0.398***		-0.590***
		(0.103)		(0.127)
Wald $\chi^2_8$		40.60***		48.48***
Observations		16,027		14,254

*Note:* Sample weights are applied in the estimation. Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Migration costs  $\bar{c}$  fall between 0 and 1. Marginal effects are calculated at the sample means of all variables. Model (1) is estimated on the same set of African countries as in Section 4.1, but Model (2) excludes Botswana and South Africa as having values outlying the GDP per capita. In Model (1), a one standard deviation increase corresponds to an increase from the sample mean of 34 to 49 years for age, 0.28 to 0.43 for arable land per person, 0.17 to 0.26 for road density, 0.84 to 1.39 for population density, 0.80 to 1.16 for land area, and 2.42 to 4.97 for GDP per capita at purchasing power parity. In Model (2), one standard deviation increase corresponds to an increase from 34 to 49 years for age, 0.28 to 0.44 for arable land per person, 0.15 to 0.23 for road density, 0.91 to 1.47 for population density, 0.73 to 1.08 for land area, and 1.45 to 2.04 for GDP per capita at purchasing power parity.

<sup>a</sup>Discrete change from 0 for female to 1 for male.

## Appendix

### A.1 The Gallup World Poll

The Gallup Organization is a research-based performance-management consulting company that has conducted polls of public opinions since 1935. Gallup began its World Poll in 2005–2006 with a survey of 129 countries and makes these first-wave data available to academics at a much lower price than the full license fee for 2005–2011 data.

With a target population of the entire civilian, non-institutionalized population aged 15 and older, Gallup interviews approximately 1,000 residents per country. All country samples are probability based and nationally representative, with the exception of unsafe areas and scarcely populated islands. Telephone surveys are conducted in the countries where telephone coverage represents at least 80% of the population or is the customary survey methodology; otherwise, interviews are conducted face-to-face.

In all countries, Gallup uses a standard set of core questions on the following themes: (a) business and economics, (b) citizen engagement, (c) communications and technology, (d) education and families, (e) food and shelter, (f) government and politics, (g) health, (h) law and order, (i) religion and ethics, (j) social issues, (k) well-being, and (l) work. The survey also includes region-specific questions, such as asking Asian and Latin American respondents about their use of the official banking system (possession of bank accounts, debit and credit cards, financial liabilities) and respondents in sub-Saharan Africa about whether anyone in their immediate family has been diagnosed or died from major diseases targeted in the Millennium Development Goals (HIV/AIDS, malaria, polio, smallpox, tuberculosis). The survey also gathers standard demographic information such as gender, age, education, and income.

For more details on the Gallup survey design, see <http://www.gallup.com/se/128147/Worldwide-Research-Methodology.aspx>. Gallup also provides access to the latest descriptive statistics issued from the World Poll through Gallup WorldView at <http://www.gallup.com/se/126848/WorldView.aspx>.

## **A.2 Migration intentions and actual migration flows**

This section compares migration intentions reported in the GWP with actual migration movements, a correspondence not likely not to be particularly high because, although the GWP data capture all intended movements, official statistics do not. First, surveys and censuses that form the bases for international and internal migration statistics are mere low frequency snapshots that omit moves with shorter stays in the destination. Second, internal migration statistics often lack a common definition of internal migration in terms of both place and time of the event. National censuses, for example, even if they record previous place of residence, define it differently, most commonly as (i) place of birth, (ii) place of residence one or five years ago, or (iii) place of previous residence regardless of when the move occurred. Also, responses to the place-of-residence questions vary widely between countries, with some countries coding prior residence at the individual village or town level and others recording only state or province. Yet the definition of the geographical unit across which movements take place has a large impact on the official figures on internal migrations. For instance, Bell and Muhidin (2009) show that changing the definition of the migration event from “changed region” to “changed municipality” of residence increases the five-year migration intensity from 2.2% to 9.99% in Brazil, from 6.32% to 16.68% in Chile, and from 3.37% to 16.57% in Canada. Finally, national statistics do not record the movements within geographical units that are implicitly reported in the GWP migration intentions data.

Because the GWP data on migration intentions refer mostly to internal moves, we compare them to recent internal migration. Specifically, we pool recent (within the last five years) internal migration rates from three sources: World Bank (2009), ECLAC (2007), and Bell and Muhidin (2009), giving priority to the most recent figure for countries referenced in several sources, although the majority of countries are cited in only one of these three, necessitating a choice between sources in only a small number of cases. From these three sources, we also pool a series on the year of the census or survey from which internal migration rates are calculated, which vary considerably from 1992 for El Salvador and Vietnam to 2006 for Argentina and Guatemala. All rates are reduced to a common denominator related to those 15 years of age or older (as in the GWP).

[Table A-1 about here]

Table A-1 shows the correlation between GWP migration intentions and actual migrations using: (i) all available observations and (ii) data on actual migrations no older than 2000 (and thus not more than five or six years older than the intentions data). Restricting the sample to more relevant data increases the rank correlation between intentions and actual flows from a statistically nonsignificant 0.21 on all available observations to 0.30, significant at 10%. These are reasonably good numbers given the flaws in the existing statistics.

### **A.3 Polychoric PCA**

This method is a refinement of the procedure used by Filmer and Pritchett (2001) to measure wealth effects in the absence of consumption data. Specifically, these authors applied principal component analysis (PCA) to data on household assets and type of housing and then used the first principal component as a proxy for socioeconomic status, breaking variables with multiple categories down into a set of binary indicators. PCA, however, is designed to deal with multivariate normal data or at least data for which normality is a plausible assumption, meaning that its application to discrete variables is not justified. To address this

problem, Kolenikov and Angeles (2009) assume instead that there are unobserved normally distributed continuous variables underlying observed discrete versions. They then estimate the correlation matrix of these latent variables, apply PCA to the matrix, and use the first component from this calculation as their measure of socioeconomic status.

The authors put forward several arguments in favor of such an approach, the first two based on eliminating the need to break categorical variables into sets of dummies. Such elimination not only enhances efficiency by allowing the exploitation of ordinal information, but, because binary indicators created from the same categorical variable are known to be negatively correlated, avoids the introduction of spurious correlation into the data. A third justification is that, because the correlations of the discretized variables are smaller than those of the underlying scores, the first component constructed from the latent continuous variables explains a higher proportion of variance. Finally, the weights of the variables used in the proxy construction, rather than being arbitrarily assumed as when the index is calculated as a sum or average of a set of categorical variables, are estimated by maximizing the likelihood function.

#### **A.4 Decomposition framework based on the Shapley value**

In this decomposition approach, the contribution of a variable  $V$  to the  $R^2$  of a regression model of  $Y$  on a set of variables  $X$  ( $V \in X$ ) is calculated as follows: First, changes in  $R^2$  are recorded for regressions of  $Y$  on all possible subsets of  $X$  that include  $V$  if  $V$  is dropped from these regressions. Second, for each regression of  $Y$  on a given subset of  $X$  including  $V$ , the weight is determined as the ratio of the number of elimination sequences that lead from the full model to the regression of  $Y$  on the given subset of  $X$  to the total number of elimination sequences leading from the full model to the model from which all the regressors are omitted.

Finally, the contribution of  $V$  is defined as the weighted average change in  $R^2$ . The same logic applies if  $V$  is not just one variable but a subset of explanatory variables.

We first designate  $R_0^2$  as the  $R$ -square of the OLS regression of the indicator of migration intentions on gender, age, and country fixed effects (baseline model) and  $R_f^2$  as the  $R$ -square of the full model of migration intentions that controls for gender, age, wealth and contentment indices, measures of a country's quality, and country fixed effects. We are interested in decomposing the increment in  $R_f^2 - R_0^2$  by the contributions of three "primary factors" (Israeli, 2007): (i) wealth factors, including contentment with personal living standard; (ii) factors related to the respondent's area of residence; that is, area security and satisfaction with local public services; and (iii) country factors that include individuals' opinions about their countries' past and future dynamics and the quality of its institutions. We denote these three factor sets as  $P_1$ ,  $P_2$ , and  $P_3$  respectively.

The contribution of  $P_1$  to  $R_f^2$  relative to  $R_0^2$  can be measured in a number of different ways, including as the difference in  $R$ -square when eliminating  $P_1$  from the full model or as the gain in  $R$ -square when adding  $P_1$  to the baseline model. Overall, there are six elimination sequences that would lead from the full to the baseline model: (i) eliminate  $P_1$ ,  $P_2$ , and then  $P_3$ ; (ii) eliminate  $P_1$ ,  $P_3$ , and then  $P_2$ ; (iii)  $P_2$ ,  $P_1$ ,  $P_3$ ; (iv)  $P_2$ ,  $P_3$ ,  $P_1$ ; (v)  $P_3$ ,  $P_1$ ,  $P_2$ ; or (vi)  $P_3$ ,  $P_2$ ,  $P_1$ . The contribution of  $P_1$  to the increment of  $R^2$  between the full and baseline models is then given by

$$C_1 = \frac{1}{6} \left( 2(R_f^2 - R_{23}^2) + (R_{13}^2 - R_3^2) + (R_{12}^2 - R_2^2) + 2(R_1^2 - R_0^2) \right),$$

where  $R_1^2$  stands for the  $R$ -square of the baseline model augmented with the first primary factor,  $R_{12}^2$  is the  $R$ -square of the baseline model augmented with the first and second primary factors, and so forth.

The contributions of the second and third primary factors to  $R_f^2$  relative to  $R_0^2$  are obtained in a similar manner, as are the shares of individual variables in the primary-factor contributions.

## A.5 Tables

Table A-1: Rank correlation between the national average propensity to migrate and the actual recent internal migration rate

Data used	Number of countries	Spearman <i>rho</i>	<i>p</i> -value
All available data	41	0.207	0.193
Data no older than 2000	32	0.302	0.093

*Note:* The recent internal migration rate and the census/survey year are pooled from World Bank (2009), Bell and Muhidin (2009), ECLAC (2007), with the most recent figure used for countries for which more than one figure is available. The national average migration propensities are calculated by the authors using the Gallup World Poll 2005–2006.

Table A-2: Response rates for the Gallup World Poll question on migration intentions

Response options	Asia		Latin America		Sub-Saharan Africa	
	# obs.	%	# obs.	%	# obs.	%
Likely to move	3,188	18.88	3,402	18.73	7,290	28.58
Unlikely to move	12,782	75.71	13,916	76.61	16,686	65.42
Don't know	874	5.18	822	4.53	1,491	5.85
Refused to answer	38	0.23	24	0.13	39	0.15
Total	16,882	100	18,164	100	25,506	100

*Note:* First wave only. The question is formulated as follows: “In the next 12 months, are you likely or unlikely to move away from the city or area where you live?” Frequencies are unweighted; see Table 1 for the weighted average propensity to migrate by region and the list of relevant countries.

*Source:* Author calculations from the Gallup World Poll 2005–2006.

Table A-3: Index construction: Wealth

Questions used	Asia	Latin America	Sub-Saharan Africa
What is the main sanitation/toilet facilities for your household?			X
What type of fuel does your household mainly use for cooking?	X		X
The main source of drinking water for household members	X		X
Does your home have a television?	X	X	X
Does your home have a computer?	X	X	X
Does your home have access to the Internet?	X	X	X
Does your home have electricity?	X	X	X
Have there been times in the past 12 months when you did not have enough money to buy food that you or your family needed?	X	X	X
Have there been times in the past 12 months when you did not have enough money to provide adequate shelter or housing for you and your family?	X	X	X
Have there been times in the past 12 months when you or your family have gone hungry?	X	X	X
First eigenvalue	4.64	4.04	4.98
Proportion of variance explained by the first component	0.52	0.58	0.50

*Note:* Sample weights are applied in the estimation.

*Source:* Author calculations based on the Gallup World Poll 2005–2006 using the polychoric PCA package for STATA (Kolenikov and Angeles, 2009).

Table A-4: Index construction: Contentment with local public services

Questions used	Asia	Latin America	Sub-Saharan Africa
Are you satisfied or dissatisfied with the city or area in which you live?	X	X	X
Would you recommend the city or area in which you live to a friend or associate as a place to live or not?	X	X	X
Is the city or area in which you live getting better or getting worse as a place to live?		X	X
In the city or area in which you live, are you satisfied or dissatisfied with the roads and highways?	X	X	
In the city or area in which you live, are you satisfied or dissatisfied with the educational system or the schools?	X	X	X
In the city or area in which you live, are you satisfied or dissatisfied with the public transportation systems?		X	
In the city or area in which you live, are you satisfied or dissatisfied with the quality of water?		X	X
In the city or area in which you live, do you have confidence in the local police force or not?		X	X
In the city or area in which you live, are you satisfied or dissatisfied with the availability of quality health care?	X	X	X
In the city or area in which you live, are you satisfied or dissatisfied with the beauty or physical setting?	X	X	X
In the city or area in which you live, are you satisfied or dissatisfied with the availability of good affordable housing?	X	X	X
In the city or area in which you live, are you satisfied or dissatisfied with the quality of air?	X	X	X
First eigenvalue	3.27	4.54	4.30
Proportion of variance explained by the first component	0.41	0.38	0.43

*Note:* Sample weights are applied in the estimation.

*Source:* Author calculations based on the Gallup World Poll 2005–2006 using the polychoric PCA package for STATA (Kolenikov and Angeles, 2009).

Table A-5: Index construction: Area security

Questions used	Asia	Latin America	Sub-Saharan Africa
Within the past 12 months: Have you had money or property stolen from you or another household member?	X	X	X
Within the past 12 months, have you been assaulted or mugged?	X	X	X
Do you feel safe walking alone at night in the city or area in which you live?	X	X	X
First eigenvalue	1.661	1.760	1.603
Proportion of variance explained by the first component	0.554	0.587	0.534

*Note:* Sample weights are applied in the estimation.

*Source:* Author calculations based on the Gallup World Poll 2005–2006 using the polychoric PCA package for STATA (Kolenikov and Angeles, 2009).

Table A-6: Index construction: Contentment with personal living standard

Questions used	Asia	Latin America	Sub-Saharan Africa
Are you satisfied or dissatisfied with your current housing, dwelling, or place in which you live?	X	X	X
Are you satisfied or dissatisfied with your standard of living, all the things you can buy and do?	X	X	X
Right now, do you feel your standard of living is getting better or getting worse?	X	X	X
First eigenvalue	2.142	1.953	2.110
Proportion of variance explained by the first component	0.714	0.651	0.703

*Note:* Sample weights are applied in the estimation.

*Source:* Author calculations based on the Gallup World Poll 2005–2006 using the polychoric PCA package for STATA (Kolenikov and Angeles, 2009).

Table A-7: Index construction: Confidence in the country institutions

Questions used	Asia	Latin America	Sub-Saharan Africa
Do you have confidence in each of the following or not?	X	X	X
How about the judicial system and courts?			
Do you have confidence in each of the following or not?		X	X
How about financial institutions or banks?			
Do you have confidence in each of the following or not?	X	X	X
How about quality and integrity of the media?			
Do you have confidence in each of the following or not?	X	X	X
How about honesty of elections?			
Is corruption widespread within businesses located in (your country) or not?		X	
Can people in this country get ahead by working hard or not?	X	X	X
Do you have confidence in each of the following or not?	X	X	X
How about national government?			
Do you have confidence in each of the following or not?	X	X	X
How about health care or medical systems?			
Do you have confidence in each of the following or not?		X	X
How about the military?			
Is corruption widespread throughout the government in (your country) or not?		X	
Are you satisfied or dissatisfied with your freedom to choose what you do with your life?		X	X
First eigenvalue	2.911	4.193	4.515
Proportion of variance explained by the first component	0.485	0.381	0.502

*Note:* Sample weights are applied in the estimation.

*Source:* Author calculations based on the Gallup World Poll 2005–2006 using the polychoric PCA package for STATA (Kolenikov and Angeles, 2009).

Table A-8: Index construction: Perception of the current country's overall situation compared to that five years ago

Questions used	Asia	Latin America	Sub-Saharan Africa
Now, I will ask you some questions about (your country). Once again, imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose the top of the ladder represents the best possible situation for (your country) and the bottom represents the worst possible situation. Please tell me the number of the step on which you think (your country) stands at the present time.	X	X	X
Now, I will ask you some questions about (your country). Once again, imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose the top of the ladder represents the best possible situation for (your country) and the bottom represents the worst possible situation. What is the number of the step on which you think (your country) stood about five years ago?	X	X	X
First eigenvalue	1.484	1.282	1.362
Proportion of variance explained by the first component	0.742	0.641	0.681

*Note:* Sample weights are applied in the estimation.

*Source:* Author calculations based on the Gallup World Poll 2005–2006 using the polychoric PCA package for STATA (Kolenikov and Angeles, 2009).

Table A-9: Index construction: Expectations for the country's situation in five years

compared to that today

Questions used	Asia	Latin America	Sub-Saharan Africa
Now, I will ask you some questions about (your country). Once again, imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose the top of the ladder represents the best possible situation for (your country) and the bottom represents the worst possible situation. Please tell me the number of the step on which you think (your country) stands at the present time.	X	X	X
Now, I will ask you some questions about (your country). Once again, imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose the top of the ladder represents the best possible situation for (your country) and the bottom represents the worst possible situation. And just your best guess, if things go pretty much as you now expect, what is the number of the step on which you think (your country) will stand about five years from now?	X	X	X
First eigenvalue	1.651	1.616	1.606
Proportion of variance explained by the first component	0.825	0.808	0.803

*Note:* Sample weights are applied in the estimation.

*Source:* Author calculations based on the Gallup World Poll 2005–2006 using the polychoric PCA package for STATA (Kolenikov and Angeles, 2009).

Table A-10: OLS regression estimates on the Asian sample.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Wealth index	0.018 (0.128)	-0.004 (0.130)	0.068 (0.131)	0.122 (0.136)	0.246** (0.122)	0.245** (0.122)
Wealth index squared	0.068 (0.120)	0.076 (0.120)	0.053 (0.119)	0.024 (0.122)	-0.075 (0.115)	-0.072 (0.116)
Male		0.017 (0.014)	0.014 (0.014)	0.010 (0.014)	0.008 (0.015)	0.008 (0.015)
Age/10		-0.029*** (0.005)	-0.029*** (0.005)	-0.028*** (0.005)	-0.030*** (0.005)	-0.031*** (0.005)
Contentment with living standard			-0.118*** (0.024)	-0.104*** (0.024)	-0.080*** (0.027)	-0.082*** (0.028)
Contentment with local public services				-0.106*** (0.033)	-0.107*** (0.037)	-0.111*** (0.038)
Area security				-0.116*** (0.043)	-0.110** (0.045)	-0.107** (0.045)
Perception of the current situation compared to that five years ago					-0.160* (0.082)	-0.153* (0.082)
Expectations for the country's situation in five years					0.094 (0.068)	0.088 (0.068)
Confidence in the country's institutions						0.016 (0.029)
Observations	7,899	7,893	7,857	7,534	6,482	6,365
R-squared	0.021	0.034	0.042	0.051	0.058	0.058
Wealth significance test: F	2.89	2.12	5.09	6.78	8.61	8.46
Wealth significance test: <i>p</i> -value	0.0558	0.1203	6.2E-03	1.1E-03	2.0E-04	2.0E-04

*Note:* The dependent variable is an indicator for the likelihood of moving away from the current place of residence over the next 12 months. All models control for country fixed effects. Sample weights are applied in the estimation. Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table A-11: OLS regression estimates on the Latin American sample.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Wealth index	-0.132 (0.103)	-0.096 (0.102)	-0.022 (0.102)	0.042 (0.105)	-0.055 (0.123)	-0.066 (0.129)
Wealth index squared	0.069 (0.086)	0.018 (0.085)	0.005 (0.085)	-0.063 (0.087)	-0.002 (0.100)	0.007 (0.107)
Male		0.030 *** (0.011)	0.030 *** (0.011)	0.031 *** (0.011)	0.025 ** (0.012)	0.026 ** (0.013)
Age/10		-0.033 *** (0.003)	-0.037 *** (0.003)	-0.034 *** (0.003)	-0.038 *** (0.003)	-0.037 *** (0.004)
Contentment with living standard			-0.130 *** (0.018)	-0.093 *** (0.019)	-0.101 *** (0.022)	-0.102 *** (0.023)
Contentment with local public services				-0.141 *** (0.026)	-0.140 *** (0.029)	-0.172 *** (0.032)
Area security				-0.085 *** (0.022)	-0.094 *** (0.024)	-0.099 *** (0.025)
Perception of the current situation compared to that five years ago					-0.053 (0.050)	-0.044 (0.053)
Expectations for the country's situation in five years					0.093 ** (0.043)	0.060 (0.047)
Confidence in the country's institutions						0.089 *** (0.030)
Observations	13,730	13,730	13,653	13,215	10,990	8,664
R-squared	0.020	0.036	0.045	0.053	0.057	0.058
Wealth significance test: F	2.13	3.94	0.17	0.82	1.52	1.41
Wealth significance test: <i>p</i> -value	0.1192	0.0195	0.8423	0.4386	0.2188	0.2448

*Note:* The dependent variable is an indicator for the likelihood of moving away from the current place of residence over the next 12 months. All models control for country fixed effects. Sample weights are applied in the estimation. Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table A-12: OLS regression estimates on the Sub-Saharan sample.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Wealth index	0.261 ** (0.121)	0.216 * (0.120)	0.314 *** (0.117)	0.435 *** (0.119)	0.441 *** (0.121)	0.433 *** (0.128)
Wealth index squared	-0.199 (0.124)	-0.198 (0.123)	-0.159 (0.121)	-0.225 * (0.122)	-0.239 * (0.126)	-0.221 * (0.132)
Male	0.022 (0.014)	0.021 (0.014)	0.017 (0.014)	0.022 (0.013)	0.022 (0.014)	0.022 (0.014)
Age/10	-0.052 *** (0.005)	-0.053 *** (0.005)	-0.048 *** (0.005)	-0.042 *** (0.005)	-0.042 *** (0.005)	-0.043 *** (0.005)
Contentment with living standard			-0.211 *** (0.020)	-0.095 *** (0.024)	-0.076 *** (0.024)	-0.085 *** (0.025)
Contentment with local public services				-0.356 *** (0.034)	-0.390 *** (0.032)	-0.397 *** (0.036)
Area security				-0.098 *** (0.025)	-0.105 *** (0.026)	-0.113 *** (0.027)
Perception of the current situation compared to that five years ago					0.058 (0.074)	0.076 (0.076)
Expectations for the country's situation in five years					0.061 (0.061)	0.050 (0.063)
Confidence in the country's institutions					0.024 (0.030)	
Observations	19,568	19,568	19,487	17,631	16,651	15,527
R-squared	0.026	0.054	0.078	0.114	0.108	0.102
Wealth significance test: F	3.52	1.69	11.52	21.64	20.08	18.79
Wealth significance test: <i>p</i> -value	0.0296	0.1838	1E-05	4.12E-10	1.96E-09	7.08E-09

*Note:* The dependent variable is an indicator for the likelihood of moving away from the current place of residence over the next 12 months. All models control for country fixed effects. Sample weights are applied in the estimation. Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .