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Harttgen, Kenneth and Klasen, Stephan

University of Goettingen

1 October 2009

Human Development
Research Paper
2009/54

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United Nations Development Programme
Human Development Reports
Research Paper

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Stephan Klasen is Professor at University of Goettingen, Department of Economics.
E-mail: sklasen@uni-goettingen.de.

Kenneth Harttgen is Professor University of Goettingen, Department of Economics. E-mail: k.harttgen@wiwi.uni-goettingen.de.

Comments should be addressed by email to the author(s).

Abstract

Migration continues to be a very important income diversification strategy, especially for poor populations in developing countries. However, while there has been much analysis on the economic consequences of migration for migrants and the receiving regions, whether internal migration improves or deteriorates human development is not easy to determine. This papers applies a recently development analytical framework that allows to calculate the HDI for subgroups of a population. We use this approach to calculate the HDI by internal migrational status to assess the differences between the levels of human development of internal migrants compared to non-migrants, and also across countries as well as by urban and rural areas. An empirical illustration for a sample of 16 low and middle income countries shows that, overall, internal migrants slightly achieve a higher level of human development than non-migrants. The results also show that differences in income between migrants and non-migrants are generally higher than differences in education and life-expectancy. Disaggregating the analysis by urban and rural areas reveals that urban internal migrants are better o® than urban non-migrants and rural migrants are better off than rural non-migrants.

Keywords: Human Development, Migration Income Inequality, Differential Mortality, Inequality in Education.

1. Introduction[1]

Internal migration continues to constitute the largest flow of people in developing countries. Within countries it is by far the most significant form of migration for the very poor population. Hence, people migrate to escape desperate poverty, to seek promising opportunities, or to diversify income sources. Much of this migration is over relatively short distances and an important flow is from rural to urban areas.

In comparison to international migration, empirical evidence on the relationship between internal migration and human well-being is still very limited although it clearly has major implications for poverty and poor people. Little is known about the size and flows of internal migrants within developing countries. The effects of internal migration on human well-being, (i.e. income, education and health) is, therefore, an important question to analyze for a better understanding of the socio-economic impact of migration on well-being. This could contribute to a better informed and focused policy debate to improve the well-being of migrants and also in the face of interventions to limit migration. However, the availability and reliability of data on internal migration is still very limited in developing countries. Hence, empirical evidence on the costs and benefits for internal migration for human well-being is still rare.

Migration can play an important role for poverty alleviation. On the one hand, migration can directly widen the opportunities to increase income levels that would be not achievable in the case of non-migrating. On the other hand, migration can also indirectly help to reduce poverty of the left behind household members, if remittances raise their standard of living. However, while migration can offer opportunities for higher incomes, this is not guaranteed and many migrants are not successful in getting better employment at their destination and many subsist in the informal sector and live in poor conditions in slums (Asfar, 2003; Black et al., 2004; Kothari, 2002; Skeldon, 2003). Whether migrants can benefit from moving is very context specific an depends on several factors, including their means (i.e. their assets and resources), their strategies (i.e. their networks and planning), as well as on the institutional environment (Whitehead, 2002). These issues have received some attention in the labor economics literature although this literature tends to be focused on international migration and on the labor market performance of

[1] We thank Michael Grimm and Mark Misselhorn for preparing the base for the calculation of the distribution sensitive HDI. We also thank Katarina Scholz and Ramona Rischke for excellent research assistance. Funding from UNDP in support of this work is gratefully acknowledged.

migrants in receiving countries, without necessarily making comparisons with the well-being of migrants at the place of origin (see Harttgen and Klasen, 2008 for a survey).

The relationship between migration and access to education and educational outcomes is discussed controversially (see, e.g. De Haan, 2000; Waddington, 2003). The empirical literature shows a diverse picture on the educational outcome of migrants. It is often assumed in the empirical literature on the factors and consequences of migration that migration undermines children's educational opportunities through taking them out of school. However, the linkage between migration and education is very context specific (see, e.g. Hashim 2005). Migration can also improve access to education and educational outcomes. Families can decide to move to provide a better life and education for their children (see, e.g. Giani, 2006). Higher income earning opportunities may then also lead to higher enrolment and literacy rates.

Migration and health can also be positively or negatively related.(see, e.g. Garenne, 2003; Lagarde et al., 2003; Waddington, 2003). On the one hand, migrants may increase their income earning opportunities, allowing them to invest more in their health status. In addition, migration can also promote health seeking behavior and the spread of knowledge on health through moving to healthier environments (IOM 2005). For example, through rural-to-urban migration, child mortality risk might decrease because mothers are better able to improve the care for their children by migrating to cities. Evidence exists that rural-to-urban migration is associated with improvement in health outcomes. For example, infant mortality rates in Ghana are significantly lower among rural-to-urban migrants compared to rural non-migrants (IOM 2005). In addition, migrating can also promote health for those left behind through remittances, helping to increase income levels and allow a better access to drugs or investment in health insurances. On the other hand, the migration process can also have negative impacts on the health status of those who migrate, which especially is a result of the migration process itself, but also through increasing health problems in urban areas. Children of rural-to-urban migrants often continue to have a higher mortality risk than non-migrants in urban areas, even if mothers have lived in urban areas for several years (Brockerhoff 1990). Using household survey data, Brockerhoff (1995) shows that children of rural-to urban migrants in developing countries experience higher mortality risk than lifelong urban residents. Furthermore, the mortality risk increases with the size of the cities, which is related to the increased concentration of low housing quality and sanitation. Lack of

adequate housing and sanitation conditions is one of the major problems of migrants in urban areas and the number of slum dwellers in developing is increasing sharply (IOM 2005). Kiros and White (2004) examine the relationship between migration and child immunization in Ethiopia. They found that children from rural-to-rural migrants have significantly lower immunization rates than children from non-migrants as a result of limited social networks of migrants within communities, which hampers their access to the health system. Furthermore, the movement of people can lead to the spread of diseases.

Before turning our well-being measure, it is important to raise an important conceptual issue. When examining the economic performance of migrants, the labor economics literature is particularly concerned about the selectivity of migrants. It might be the case that the more motivated and those with better unmeasured skills or human capital are more likely to migrate, as they expect greater income benefits from migrating. This is an issue that we cannot address here as we do not have any information that would allow us to model the decision-making process that led to migration. We are just investigating whether migrants are better off in human development terms, compared to non-migrants, which we believe to be an important research question in itself.

To measure human well-being, this paper uses the Human Development Index (HDI). The HDI is a composite index that measures the average achievement in a country in three basic dimensions of human development: a long and healthy life, as measured by life expectancy at birth; knowledge, as measured by the adult literacy rate and the combined gross enrollment ratio for primary, secondary and tertiary schools; and a decent standard of living, as measured by GDP per capita in purchasing power parity US dollars (World Bank, 2008). Based on available statistics UNDP was able to provide an HDI for 179 countries in the latest Human Development Report (UNDP, 2008). The HDI is today widely used in academia, the media and in policy circles to measure and compare progress in human development between countries and over time.

Despite its popularity, which is among other things due to its transparency and simplicity, the HDI is criticized for several reasons.[2] First, it neglects several other dimensions of human well-being, such as human rights, security and political participation (see e.g. Anand and Sen (1992), Ranis, Stewart and Samman (2006)). Second, it implies substitution possibilities between the three dimension indices, e.g. a decline in life expectancy can be offset by a rise in GDP per

[2] For a critical review, see e.g. Sagar and Najam (1998).

capita.[3] Related to that critique is the third point, which charges that the HDI uses an arbitrary weighting scheme of the three components (see e.g. Kelley (1991), Srinivasan (1994) and Ravallion (1997)). Finally and fourth, the HDI is often criticized because it only looks at average achievements and, thus, does not take into account the distribution of human development within a country or achievements by certain groups such as migrants versus non-migrants (see e.g. Sagar and Najam (1998)). It is this last issue that we address in this study.

When constructing measures of human development by groups, limited data availability on the distribution of human development achievements seriously constrains the analysis. Household income surveys are today widely conducted and, hence provide data on income distribution, but it is much more difficult to get data on life expectancy, educational achievements and literacy by groups. Inequality in these dimensions seems, at least in developing countries, also to be very high.[4]

In this paper, we apply a recently developed approach by Grimm et al. (2008) to calculate a distribution sensitive HDI.[5] This approach differs from others in that, first, it focuses on human development for different subgroups of the population (with Grimm et al. (2008) focusing on different income groups). Second, it does not try to incorporate the aggregate well-being costs associated with existing inequalities, but rather generates a separate HDI for different segment of the population. More precisely, it takes household income and demographic data to compute the three dimension indices for different segments of the population. Applying this approach allows us on the one hand to track the progress in human development separately for `internal migrants' and `non-migrants' and on the other hand to compare the level of human development of internal migrants and non-migrants disaggregated by urban and rural areas.

[3] Moreover, if poor people face higher mortality, their deaths would increase per capita incomes of the survivors, generating a further distortion, particularly in HDI trends over time.

[4] There is also broad empirical evidence that mortality as well as educational attainment vary with income and wealth in both rich and poor countries (see e.g. Cutler, Deaton and Lleras-Muney (2006) and Filmer and Pritchett (1999)).

[5] In the past, several attempts have been made to integrate inequality into the human development index. For example, Anand and Sen (1992) and Hicks (1997) suggested to discount each dimension index by one minus the Gini coefficient for that dimension before the arithmetic mean over all three is taken. Therefore, high inequality in one dimension lowers the index value for that dimension and, hence its contribution to the HDI. he gender related development index, or GDI, was another attempt in that direction. Its motivation was the 1995 Human Development Report's emphasis on gender inequalities. Another attempt was undertaken by Foster, Lopez-Calva and Szekely (2003). They chose an axiomatic approach to derive a distribution sensitive HDI. For a more detailed overview of existing approaches, see Grimm et al. (2008).

The objective of this paper is first to determine whether there are differences in the level of human development between internal migrants and non-migrants using the HDI as a composite welfare indicator. We will show that our methodology also has some shortcomings, and, hence, all presented results should be interpreted with caution and in the light of our assumptions. The reminder of this paper is organized as follows. Section 2 presents the methodology. Section 3 presents the sample of countries for which we illustrate it. Section 4 discusses the results. Section 5 offers a critical assessment of our methodology. Section 6 concludes.

2. Methodology

2.1 General idea and overview

This section follows closely the description of the methodology of Grimm et al. (2008). The basic idea of the method is to use disaggregated data to calculate the three dimension indices, which constitute the HDI, by internal migrational status. This allows getting an idea of the heterogeneity and inequality in human development, which exists within a country between specific population subgroups. As data sources, we use household surveys. As segments for the comparison, we look at internal migrants and non-migrants within developing countries.

Since the early nineties, two types of surveys are being carried out in almost all developing countries. First, there are so-called *Living Standard Measurement Surveys* (LSMS) or a lighter version of it called *Priority Surveys* (PS). Even in countries were none of these two surveys are available, there exist normally at least some other type of living standard survey. These surveys provide, apart from information on household and individual characteristics, data on educational achievement, school enrollment and household income or household expenditure. In what follows, we call this type of survey simply `household income survey' or `HIS'. Second, there are so called `Demographic and Health Surveys' or `DHS' in short. These surveys are undertaken by *Macro International Inc., Calverton, Maryland* (usually in cooperation with local authorities and funded by USAID) and provide among other things detailed information on child mortality, health, and fertility.

Hence, we will use the HIS to calculate the migration specific education and GDP indices and the DHS to calculate the migration specific life expectancy index. However, the main problem in proceeding so, is that both surveys do not interview the same households (or if so, these households cannot be matched directly). Since both survey types include information on the internal migrational status, we will match both data sources by the respective migrational status of the individuals.

Once the three dimension indices are calculated, we simply calculate the migration specific HDI, which we name MHDI, by taking the arithmetic average of the three dimension indices. In what follows, each step of our method is explained in detail.

2.2 Internal migrational status

To analyze differences in human development between internal migrants and non-migrants not only within countries but also across countries, we need to define the internal migrational status on which information is available and similar across the HIS and DHS surveys used in our sample.

The information of the migrational status of individuals varies from survey to survey and from country to country. To define the migrational status, we use the question that is available in each survey whether the individual was born in the current place of residence. Since the other dimensions of the HDI (i.e. literacy, enrolment and expenditure/income) are estimated at the household level, we also define the migrational status at the household level.[6] Thus, the migration dummy takes the value 1 if the household head was not born in the current place of residence and 0 if the household head still lived at the place of birth at the time of the survey.[7]

We are aware that this simple segregation has some shortcomings. In simply asking whether the individual still lives at the place of birth or not, neglects a lot of information, which could be

[6] If we define income/expenditure per capita at the household level and then define the migrational status at the individual level, we would not be able distinguish between internal migrants and non-migrants within households.

[7] In particular, if the information is available, we specify whether the different place of residence is in a different district to avoid defining households as internal migrants although the head had come from a neighbored village within the same district. In addition, we exclude those households that have their place of birth abroad to avoid mixing up internal migrants with international migrants.

potentially important and interesting to consider. First, we fail to take into account a time dimension of migration, i.e. the length of stay in the host area and whether it is permanent or semi-permanent, because this information is not available in the HIS data sets, but only in the DHS.[8]

Second, we also fail to take into account the reason of migration, which could be an important determinant for the well-being status of the individual. For instance, there might be a difference if migrants decide to move for educational purpose than for 'survival' reasons. In addition, differences also might exist between forced migration and labor migration. For example, in Guatemala a lot of internal migration is related to displacement during the conflicts of the 1980s. However, reasons of migration are not included in almost all of the surveys.

Third, we can fully take into account the impact of remittances in our assessment. In particular, it may be the case that a household has sent someone away in the past who is providing remittances. In our accounting, such a household would be seen as non-migrating if the household head has not migrated. The remittances would be added to household incomes, making this household better off; in this sense the indirect benefits of migration would make non-migrants also better off. This has to be borne in mind when interpreting the results.

A closely related fourth short-coming is the inability to link migrating household members with their household of origin. Migrants that still send remittances and occasionally visit their household of origin will here be captured as separate households in their destination and their link to the household of origin cannot be made.

Therefore, in what follows, we simply compare the human well-being, measured by the HDI, between internal migrants and non-migrants within and across countries. In addition, we disaggregate our samples by urban and rural areas, which allows us to analyze differences between internal migrants and non-migrants in urban and rural areas and we also ask what the differences in human development are, for example, between urban migrants and rural non-

[8] In the next research step, we could take Zambia in which this information are available in both surveys to further disaggregate the migrational status by the time since migration. However, the length of stay could be an important determinant of the well-being of the individual. For instance, the chance of finding a job through a better established social network increases with the time of stay. We also do not take into account seasonal migration, which is especially important for seasonal workers in rural areas. However, also this analysis could principally be done in the next step of the paper, since the household surveys in the sample also ask for how long the individual was away from the household within the past 12 months.

migrants. The latter comparison is very interesting because it directly focuses on the effect of urban-to-rural migration on human development.

2.3 Calculating the life expectancy index by internal migrational status

To calculate a life expectancy index by migrational status, we combine information on child mortality with model life tables. As mentioned above, the HIS provides usually no information on mortality. The DHS provides only information on child mortality, but not on mortality by all age groups, which would be necessary to construct a life table and to calculate life expectancy directly.

In a first step, we calculate under one child mortality rates for internal migrants, non-migrants and for the total sample. To do this we use the information on all children born in the five years preceding the survey. For each child i we calculate the survival time S_i expressed in months m and the survival status d_i. The status variable takes the value one if the child died at the end of S_i and the value zero, if the child was still alive at the age of one. Then we use a simple non-parametric life table estimator to estimate the survival probability for each month after birth, p_m. Through cumulative multiplication we derive for internal migrants and non-migrants the under one mortality rate q_1:

$$q_1^M = 1 - \prod_{m=1}^{12} p_m^M, \qquad (1)$$

We also estimate q_1 over the whole sample, to be able to construct the aggregate life expectancy index.

In a next step, we use the estimated mortality rate q_1 and Ledermann model life tables to calculate migration specific life expectancy. Ledermann (1969) used historical mortality data for many countries and periods to estimate the relationship between life-expectancy and age-specific mortality rates. He found the following relationship (note that the *log* function uses the basis 10):

$$\log q_1 = \hat{a}_{f,0} + \hat{a}_{f,1} \log (100 - e_0) \qquad (2)$$

where $\hat{q}_j$ s the predicted mortality rate for the age group *j*, e_0 is the life expectancy at birth and $\hat{a}_{j,0}$ and $\hat{a}_{j,1}$ are the estimated regression coefficients by Ledermann. Ledermann considered age groups defined over five-year intervals, except for the first age group, which he divided into children aged zero to one years and one to five years old.[9] However, a drawback this type of tables is that their estimation included almost no countries of today's developing world and no countries affected by the AIDS epidemic. In particular the latter might be problematic, given that AIDS usually strongly affects the age-mortality pattern by increasing mortality among children below the age of 5 (through mother-child transmission) and mortality among adults in age of activity.[10]

To calculate migration specific life expectancy, we take the inverse of Equation (2) and the regression coefficients for the age group 1 year old:

$$\hat{e}_0^M = 100 - \left[\frac{q_1^M}{10^{\hat{a}1,0}} \right]^{\frac{1}{\hat{a}_{1,1}}} \qquad (3)$$

with $\hat{a}_{1,0} = -1.98384$ and $\hat{a}1,1 = 2.40372$ (Ledermann, 1969).

Aggregate life expectancy can be calculated using q_1 instead of q_1^M. In what follows, the subscript *M* represents the internal migrational status and takes the possible outcomes: internal migrants and non-migrants.

[9] In principle, we could also use the Princeton model life tables (Coale and Demeny, 1983), but the problem with those tables is, that first they use not e_0 but e_{10} as entry, i.e. life expectancy at the age of 10. Obviously, it is easier to estimate e_{10} given the probably higher measurement error in child mortality, but to construct the *MHDI* we need e_0 not e_{10}. Second, Princeton tables end already at a life expectancy of 75 years. Third, Princeton tables are defined separately for men and women, and, hence we would need to estimate child mortality rates separately for boys and girls. This would reduce the number of death events in each subgroup to extremely low levels and therefore lead to very unstable life expectancy estimates. We checked however, whether our life expectancy estimates were consistent with those one would obtain using the Princeton Life Tables `West'. That was the case, and, hence, we are confident that our Lederman approach yields acceptable results.

[10] To check whether there might be a problem of systematically overestimating life expectancy especially for AIDS affected countries in the sample using the Lederman Life tables, we did a simulation combining the Lederman formulae with available information on Life expectancy by the UNICEF (UNICEF 2004) and the UN (UNDP 2008). In particular, we applied the infant mortality rates provided by UNICEF to the Lederman formulae for a sample of developed and developing countries and also for countries that are heavily affected by the HIV/AIDS epidemic. We then compared the official, but also estimated, life expectancy provided by UNICEF and UN, with our estimated life expectancy. We found that we slightly overestimate life expectancy compared to the values of the UN and UNICEF. For the AIDS affected countries this overestimation is higher than for other developing and developed countries.

Then we calculate the migration specific life expectancy index, L^M, using the usual minimum and maximum values for life expectancy employed to calculate the HDI:

$$L^M = \frac{\hat{e}_0^M - 25}{85 - 25}. \quad (4)$$

The aggregate life expectancy index L can be calculated using $\hat{e}_0$ instead of $\hat{e}_0^Q$.

In a last step, we linearly rescale L^M and L to achieve consistency with the aggregate HDI calculated by UNDP. As rescaling factor we use the ratio between our aggregate life expectancy index L and the aggregate life expectancy index calculated by UNDP for the particular year in question.[11]

2.4 Calculating the education index by internal migrational status

To calculate the migration specific education index, we use the information on literacy and school enrollment provided by the HIS.[12]

2.4.1 Calculating the adult literacy index

The questions providing information about adult literacy may significantly vary from one HIS to the other. Sometimes adults are simply asked whether they are able to read and write. Other surveys are much more specific in asking whether the person is able to read a newspaper and to write a letter. This is even sometimes directly tested. In addition, in some countries one has to distinguish between having knowledge of any local language or of the official language of the country. Finally in some surveys, such information is completely missing. In the latter case, it is possible to use educational achievement as proxy for literacy. However, it is far from evident to determine after how many years of school a person is literate. This varies a lot from country to country or even within a country (for West-Africa, see e.g. Michaelowa (2001)). We proceeded

[11] If the DHS and HIS are from different years, we rescale to the later year. Consistency is not automatic, given that our approach and UNDP's approach are based on different data sources.
[12] We further illustrate the approach by using information on education from the DHS data. See Section 4.1.

as follows. If an adult declared to be able to read and write in any language (with or without proof), we considered him or her as literate. If that information was not available, we considered somebody as literate if he or she achieved at least a grade which corresponds to five years of schooling. Adults are defined to be persons above the age of 15.

Migration specific adult literacy is then calculated by the following equation:

$$a^M = \frac{1}{n^M} \sum_{i(\forall j>15)} I(a_i^M > \bar{a}), \tag{5}$$

where n^M is the total number of adults for internal migrants, non-migrants and for the total country and I is an indicator function which takes the value one if literacy status of adult i, a_i is over the above defined threshold value $\bar{a}$ and zero otherwise. We calculate also the aggregate adult literacy rate a.

Then we calculate the migration specific adult literacy index, A^M, using the corresponding usual minimum and maximum values employed in the HDI:

$$A^M = \frac{a^M - 0}{1 - 0}. \tag{6}$$

The aggregate adult literacy index A can be calculated using a instead of a^M.

In a last step, we linearly rescale again A^M and A to achieve consistency with the aggregate HDI calculated by UNDP for the respective year. As rescaling factor we use the ratio between our aggregate literacy index A and the aggregate literacy index calculated by UNDP.

2.4.2 Calculating the enrollment index

To calculate the migration specific gross enrolment index, we first calculate the combined gross enrolment rate by internal migrational status. Each individual attending school or university, whether general or vocational, is considered as enrolled. We define this rate over all individuals of the age group 5 to 23 years old. Age for each individual corresponds the age at the date of the interview. This yields:

$$g^M = \frac{1}{n^M} \sum_{i(\forall 5 \le j \le 23)} I(g_i^M > 0). \quad (7)$$

where n^M is the total number of individuals of age 5 to 23 within the group of migrants, non-migrants, and for the total country and I is an indicator function which takes the value one if an individual i independent of age, is enrolled, i.e. $g_i>0$. We also calculate the aggregate gross enrolment rate g.

Then we calculate the migration specific gross enrollment index, G^M using the minimum and maximum values used for the calculation of the HDI:

$$G^M = \frac{g^M - 0}{1 - 0}. \quad (8)$$

The aggregate gross enrollment index G can be calculated by using g instead of g^M. Finally, we rescale G^M and G to the level of the HDI enrollment index.

2.4.3 Calculating the education index

The migration specific education index E^M is calculated using the same weighted average as the HDI:

$$E^M = (2/3) \cdot A^M + (1/3) \cdot G^M. \quad (9)$$

The aggregate education index E can be calculated by using A and G instead of A^M and G^M.

2.5 Calculating the GDP index by migrational status

To calculate the GDP index by migrational status, we use the income/expenditure variable from the HIS. One main difference to the two other dimension indices is that mean income calculated from the HIS can be *very* different from GDP per capita derived from National Accounts data, which is used for the GDP index in the general HDI. This has two reasons: first, conceptual differences and, second, measurement error on both levels. GDP measures the value of all goods

and services produced for the market within a year in a given country valued at market prices. Income in the household survey is either measured, as mentioned above, via household expenditure (including self-consumed production) or via the sum of earned and unearned household income. Therefore, non distributed profits of enterprises, property income and so on will not be included in the household income variable. Moreover, on the household survey side, there may be measurement errors, because it is difficult to get accurate responses from households concerning wages and profits (especially from self employment and in rural areas).[13] On the National Accounts side, while supply-side information on output and income for some sectors is based on high-quality surveys or census data for agriculture and industry, information about subsistence farmers and informal producers is harder to obtain and usually of lower quality.[14]

We proceed as follows. First, to eliminate differences in national price levels we express household income per capita y_h calculated from the HIS, in USD PPP using the conversion factors based on price data from the latest International Comparison Program surveys provided by the World Bank (2008):

$$y_h^{PPP} = y_h \cdot PPP \tag{10}$$

Second, we rescale y_h^{PPP} using the ratio between $\overline{y}^{PPP}$ and GDP per capita expressed in PPP (taken from the general HDI), i.e. we only take the information on the distribution of income from the HIS and stick with GDP per capita as the level of income:

$$ry_h^{PPP} = y_h^{PPP} \cdot \left[\frac{GDPPC^{PPP}}{\overline{y}^{PPP}} \right]. \tag{11}$$

Once, theses adjustments are done, it is straightforward to calculate the migration specific GDP index, again using the minimum and maximum values of the HDI:

$$Y^M = \frac{\log \overline{ry}^{M,PPP} - \log(100)}{\log(40{,}000) - \log(100)}, \tag{12}$$

[13] If available, therefore, use expenditure rather than income to calculate the migration specific GDP index.
[14] A detailed discussion of all these problems can be found in Ravallion (2001) and Deaton (2005).

where $\overline{ry}^{Q,PPP}$ is the migration specific arithmetic mean of the rescaled household income per capita.

2.6 Calculating the overall HDI and the HDI by migrational status

Once the migration specific dimension indices have been calculated, determining the MHDI is straightforward. It is the simple average of the three dimension indices:

$$HDI^{M} = (1/3) \cdot L^{M} + (1/3) \cdot E^{M} + (1/3) \cdot Y^{M}$$

The aggregate HDI is as usual given by:

$$HDI = (1/3) \cdot L + (1/3) \cdot E + (1/3) \cdot Y \qquad (13)$$

To get a sense of the inequality in human development within a country, one may compute the ratio between the HDI for the internal migrants and the non-migrants:

$$RMHDI = \frac{HDI^{MIgrants}}{HDI^{Non-Migrants}}. \qquad (14)$$

All these indicators can of course also be calculated for each dimension index. Hence, the MHDI cannot only be used to inform about the level of human development of internal migrants and non-migrants showing inequality in human development within a country, it allows also to further disaggregate the sample by more specific subgroups. In this paper, we further disaggregate the migration specific MHDI also by region to compare the human well-being of migrants and non-migration separately for urban and rural areas.

3. Sample of countries

We illustrate our approach for a sample of 16 developing countries. The selection of the country sample is mainly driven by data availability, since we need for each country both a DHS and a HIS data set. Our sample includes seven countries from Sub-Saharan Africa (Cameroon, Cote

d'Ivoire, Ghana, Guinea, Madagascar, Uganda, and Zambia), five countries from Latin America (Bolivia, Colombia, Guatemala, Nicaragua, Paraguay and Peru), two countries from South-East Asia (Indonesia and Vietnam), and one transition country (Kyrgyz Republic). These countries are listed in Table A1 in the Appendix. We tried to restrict the sample to countries where a HIS and DHS were undertaken within a two-year time period. For three countries both surveys were undertaken in the same year. For four countries there is a gap of one year and for two countries a gap of two years. Only in five countries we were not able to follow this rule and have actually a gap between both surveys of three to four years.

Moreover, we tried to include countries where both surveys are not older than the year 2000. This was however not possible for six countries (Cote d'Ivoire, Ghana, Guatemala, Guinea, Kyrgyz Republic, and Madagascar), where the HIS or the DHS (or both) were undertaken at the end of the 1990s. The survey dates should also be taken into account when comparing our unscaled MHDI with the usual HDI. The published HDI in the UNDP's Human Development Report 2008 (UNDP, 2008) refers to the year 2006. But a closer look at the data sources shows that literacy rates and life-expectancy estimates were usually based on censuses or surveys conducted between 2000 and 2004. In several countries the data sources even stem from data collected in the 1990s. Hence, time consistency between the different dimension indices and actuality of the data is not a problem specific to our approach, but rather is present for both the usual HDI and the MHDI.

To be consistent with the values of the total HDI, we rescale our values with the value of the HDI published in the Human Development Report for the respective survey year (i.e. the second survey year if there is a difference between the DHS year and the HIS year). For migrants and non-migrants as well as for all values for urban and rural areas, we use this rescaling factor and multiply the respective values with this factor.

4. Results

4.1 Human development by migrational status

Table 1 shows the overall HDI, the MHDI by internal migrational status, the ratio of the MHDI for the internal migrants to the non-migrants, and the HDI ranking for the whole country for the

16 countries of our sample. Five Sub-Saharan countries show an overall HDI value below the threshold of 0.5 (Cote d'Ivoire, Guinea, Madagascar, Uganda, and Zambia) and, hence, are considered as countries with low human development, while all other countries are considered as countries with medium human development with an overall HDI value between 0.5 and 0.8.

We focus on differences between internal migrants and non-migrants within countries. The results reveal some differences in human development between the internal migrants and non-migrants. From the 16 countries in our sample, 14 countries (Bolivia, Cameroon, Cote d'Ivoire, Ghana, Guinea, Indonesia, Kyrgyz Republic, Madagascar, Nicaragua Paraguay, Peru, Uganda, and Vietnam) show a higher value in human development for internal migrants than for non-migrants, which is nicely illustrated by the ratio of the MHDI for the internal migrants to the non-migrants. However, for two of these countries (Colombia and Peru) the differences in human development between internal migrants and non-migrants are not very large. Here, the ratio of the MDHI value of the internal migrants to the non-migrants is very close to one. For two countries (Madagascar and Uganda), the inequality within countries is much higher than for the other countries, resulting in a ratio of the MHDI of the internal migrants to the non-migrants that is higher than 1.1 (in particular, 1.155 and 1.141). The largest within country inequality in human development between internal migrants and non-migrants is found for Guinea with a ratio of 1.232. Only for two countries (Guatemala and Zambia), the ratio of the MDHI for the internal migrants to the non-migrants is less than 1 indicating a higher human development for the non-migrating population group. The largest 'penalty' for migration is found for Guatemala, where non-migrants show a substantially higher level of human development than internal migrants (i.e. 0.784 compared to 0.673). This finding is likely to be related to the special historical situation in Guatemala. In particular, it is likely to reflect the high share of internal migrants related to forced displacement during the conflicts in the 1980s. Hence, in Guatemala, many internal migrants were internally displaced with all the hardships such a displacement involves, and probably the group of 'successful' migrants is expected to have been able to move abroad, i.e. to Mexico or to USA.[15]

The rank positions of the different migrational status further illustrate inequalities between migrants and non-migrants between and across countries. First, we observe a large difference on

[15] In the case of Zambia, the worse human development record of migrants might be related to the deteriorating economic conditions in urban areas as a result of economic crises and economic reforms of the 1980s and 1990s.

the overall development across countries. The sample of countries can be broadly separated into three main groups. The first group, showing a relatively high level in human development with a HDI rank below 100, consists of countries from Latin America, namely Paraguay, Peru, and Colombia. The second group of countries with in overall ranking position below 130 consists of Bolivia, Guatemala, Indonesia, Nicaragua, and Vietnam. The third group that shows the overall lowest levels of human development consists of countries from Sub-Saharan Africa, namely Cameroon, Ghana, Guinea, Madagascar, Uganda. The lowest end of the ranking builds Zambia with an overall rank of 160.

Second, when concentrating on inequalities within countries between internal migrants and non-migrants based on the HDI ranking positions, we can broadly define three different groups of countries. The first group consists of three countries from Latin America, namely Bolivia, Colombia, Ghana, Kyrgyz Republic, Nicaragua, Peru, Uganda, and Vietnam, showing only small absolute differences in the ranking positions between internal migrants and non-migrants. For example, whereas internal migrants in Peru were ranked at position 73, non-migrants were ranked at position 75. This finding is very interesting because usually countries from Latin America show large income inequalities and large inequalities in education. The second group of countries shows sizable differences in the ranking positions, which is found for Cameroon, Cote d'Ivoire, Vietnam, and Zambia with differences close to ten rank positions. For example, whereas internal migrants in Cameroon achieve a HDI rank of 136, non-migrants were ranked at position 145. The third group of countries shows quite large absolute differences of more than ten ranking positions (Guinea, Indonesia, Kyrgyz Republic, Madagascar, and Paraguay. The largest absolute differences are found for Guatemala, Paraguay, and Madagascar. Whereas internal migrants in Madagascar achieve a rank of 134, non-migrants achieve only a rank of 153. The situation in Guatemala is reversed. Here non-migrants are ranked at position 58 whereas internal migrants are only ranked at position 112. These differences between internal migrants and non-migrants within countries and also across countries are also illustrated in Figure 1.

To summarize the findings from Table 1, internal migrants show higher HDI values than non-migrants in 14 from 16 countries in the sample. In Guinea, the largest difference in human development is found between migrants and non-migrants, whereas in Guatemala, the largest

reverse finding is observed where non-migrants show a considerably higher HDI value than internal migrants.

Despite these findings, one should point out that the differences in human development performance between migrants and non-migrants are not very large, esp. when compared to the differences in human development by income group (see Grimm et al, 2008). There we found that the ratio in the HDI between the richest and the poorest quintile could as much as 2 or more, while here the difference rarely exceeds 20%. Thus the differentiation between migrants and non-migrants in terms of their human development is much smaller, but still noticeable.[16]

We now have a closer look at the subindices of the HDI and focus on the question which component has the largest effect on the inequality between internal migrants and non-migrants of the total outcome of the MHDI. When examining the individual components, it becomes evident that the biggest effect of differences in the migration specific HDI comes from the income component. Table 2 shows the migration specific GDP indices (Y) by country. Overall, we find very low levels in the GDP index among the countries in our sample. For example, Zambia shows an overall value of only 0.366. 13 countries show quite substantial and significant inequality effects in the GDP index between internal migrants and non-migrants. Here, internal migrants achieve larger index values than non-migrants. The largest inequality is found for Sub-Saharan African countries, namely Guinea (1.268), Madagascar (1.239), and Uganda (1.252). What is also interesting to see is that in Table 2 the GDP index is lower for migrants in the same countries as was found for the overall HDI in Table 1 (Guatemala, and Zambia). For Guatemala, the ratio of the GDP index shows a value of 0.815 indicating again that non-migrants are better off than internal migrants (0.747 compared to 0.659). In sum, again from the 16 countries 14 show a higher value of the GDP index for internal migrants than for non-migrants.

Table 3 shows the migration specific education indices by country. The differential in education achievements (E) between the internal migrants and non-migrants are also sizable, but smaller than in the GDP index, which is also reflected in the lower significance between the outcomes for internal migrants and non-migrants. In most countries, the differentials are not very large

[16] To some degree, this is to be expected. If the differential were extremely large, one would imagine that migration flows would respond to this. While it is much harder to choose one's income bracket (which is often related to pre-determined factors beyond one's control) one has a significant control over one's migrant status and can therefore respond to differential much more readily.

reflecting substantial efforts to improve education. One should note, however, that education is only reflecting literacy and enrolment rates and says little about educational quality. The largest differences in educational achievement between internal migrants and non-migrants are found for Cote d'Ivoire, Guinea, and Uganda. Internal migrants in Guinea show a substantially higher index than the non-migrants (0.493 compared to 0.310) resulting in a ratio of internal migrants and non-migrants of 1.589. Again, Guatemala, and Zambia show a reverse finding, which was already found for the total MHDI and the GDP index. Whereas the differences in the education index are small Zambia, in Guatemala, non-migrants show a considerably higher education index than internal migrants (0.804 compared to 0.671). All other countries reflect the foregoing picture that the human development is higher for internal migrants than non-migrants. Although in Nicaragua and Peru, the ratio of the education index between internal migrants and non-migrants show a reverse finding than found in Table 1, namely that non-migrants show a higher value than internal migrants, the difference is small with a ratio very close to one. In sum, almost all countries show a higher education index for internal migrants than for non-migrants.

To verify the findings for the education index between internal migrants and non-migrants, we also provide the calculation for the education index based on information on education from the DHS data sets. Although no direct information on literacy is available in the DHS data sets, we define an individual as literate if she or he has at least five years of education completed (age 15+). This leads to a higher number of observations since the DHS surveys include more young people. The differences in the enrollment and literacy rates are presented in Table A2. For most of the countries, the differences in the means are not very large.[17] Interesting to see is that the mean values for literacy and enrollment are generally lower in the DHS data sets than in the HIS data sets.[18]

Table A3 shows the results for the education index based on the DHS data and Table A4 shows the results for the migration specific HDI, where the education index is based on the DHS data sets. Looking at the education index, large similarities between the findings based on the DHS

[17] In Madagascar, the large differences mainly stem from the different definition are a result of many missing values for the literacy variable in the HIS data set. If we take the five years of education completed as the literacy definition, about 65 percent were literate in 2001 in Madagascar. Therefore, in the case of Madagascar we now use this definition to calculate the MDHI for both surveys.

[18] One reason for the differences in the literacy rates stems from the way literacy is measured. Whereas in the HIS we use the direct information whether an individual is able to write and read, for the DHS we use the information whether the individual has at least five years of schooling completed.

and based on the HIS data sets can be observed, especially for those countries for which we found the largest differences between internal migrants and non-migrants such as Guatemala. Overall, also Table A3 shows that internal migrants have a higher education index than non-migrants. However, Table A3 also shows some differences to Table 3. For example, whereas Table 3 shows a ratio of internal migrants to non-migrants for Bolivia of 1.030, Table A3 shows a ratio of 0.989, which indicates a small reverse finding. The largest differences are found for Cote d'Ivoire, which is mainly driven by the large differences in the enrolment rates between the HIS and the DHS data sets. The same holds also for Nicaragua and Peru.

Given these somewhat different findings we prefer the HIS data as the basis to calculate the education index for two reasons. First, the HIS data sets include the direct question whether the individual is literate, whereas this information is not available in the DHS data and where we define an individual as literate if she or he has at least completed five years of schooling. Second, there might also be a sampling issue when using the DHS as basis for the education index. In particular, the DHS data sets include only information on women aged 15-49 and on their respective household members. Hence, there is no information, for example, on single male households.[19] The differences between the education index based on the HIS and on the DHS data has no big impact on the overall findings. When looking at the overall MHDI, Table A4 shows only small differences to Table 1, which strengthens our findings.

Table 4 shows the migration specific life expectancy index by country. The differential in life expectancy achievements (L) between internal migrants and non-migrants are also present and significant, but generally the smallest of the three components. While one reason for the smaller inequality in the life-expectancy index compared to the two other dimension indices may be related to data quality issues and the assumptions that were made in order to derive these estimates (see also Section 5) it appears that inequality in life expectancy is indeed smaller in the developing countries considered than other forms of inequality.

Two cautionary notes are important. To some extent, such smaller inequality can be expected given that life expectancy is effectively bounded above, i.e. there are limits to life expectancy that even high income people run up against. Second, even seemingly smaller differentials in life

[19] On the other hand, there might also be sampling issue for the Indonesian HIS data which contributes to the differences between the findings, because the 3rd Indonesian Family Life Survey provided by RAND represents only about 83 percent of the total population.

expectancy may be seen as just as important, or even more important, than larger differentials in the other components. After all, the chance to live and be free from the fear of premature mortality is a fundamental precondition for all other aspects of life.

What is interesting to see in Table 4 is that from the 16 countries only 8 countries show a higher life expectancy index for internal migrants than for non-migrants. For Cameroon, Colombia, Cote d'Ivoire, Guatemala, Guinea, and Nicaragua we found a reverse finding of the life expectancy compared to the GDP index, the education index and to the overall MHDI. Here, internal migrants show lower values in the life expectancy index than non-migrants. However, these differences are quite small and, therefore, have little impact on the overall MHDI. For the other countries, the relationship shows the same direction.

To further disaggregate the results we have found for the total MHDI and the three sub-indices, Table 5 presents the infant mortality rates, the estimated life expectancy, the enrolment rates, the literacy rates and the per capita income/expenditure as well as the sample size. Looking at the mortality rates and the estimated life expectancy helps to explain the results found in Table 4. For the countries where we found a reverse relationship between internal migrants and non-migrants, the infant mortality rates are higher for the internal migrants than for the non-migrants resulting in a higher life expectancy among the non-migrants. However, we see that the differences in the mortality rates (and thus in life expectancy) are only very small.

More interesting differences are found for the enrolment rates and the literacy rates. Since enrolment can be seen as an ex-post aspect of migration as families might be better able to send their children to school, and since literacy can be seen as an ex-ante aspect of migration as low levels of education motivates people to move, it is interesting to see whether there are differences between these two components of the education index between migrants and non-migrants. In fact, Table 5 shows that for several countries the differences between internal migrants and non-migrants have different directions between enrolment and literacy. For example, whereas only in Guatemala and Zambia the adult literacy rates are higher for the non-migrants than for the internal migrants, higher enrolment rates for the non-migrants compared to the internal migrants are observed for Cameroon, Cote d'Ivoire, Ghana, Guatemala, Paraguay, Peru, Vietnam, and Zambia. As already mentioned above, it would be very interesting to see whether the time since migration has an impact on these differences.

Looking at the income component Table 5 shows that in Guatemala and Zambia, per capita income/expenditure is higher for the non-migrants than for the internal migrants, reflecting the results from Tables 1 and 2. Interesting is that in Nicaragua has slightly higher incomes/expenditures are observed for the non-migrants, but this effect is compensated by higher life expectancy and education for the internal migrants resulting in an overall MHDI that is higher for the internal migrants.

To summarize the results, we find a clear trend towards a significantly higher MDHI for internal migrants than for non-migrants. From the 16 countries in the sample, 14 show a higher MHDI for internal migrants than for non-migrants. Only for Guatemala, Vietnam and Zambia we found a MHDI that is higher for non-migrants than for internal migrants. We also found differences between the three sub indices. The largest effect is found for the GDP index, where the highest inequalities between internal migrants and non-migrants are observed. Also sizable differences exist for the education component. Differences in life expectancy are very small.

The relatively large income effect on the total outcome of the MHDI, compared to impact of the education index and the life expectancy index is not very surprising. The main reason for individuals to migrate is to improve their income-earning opportunities, which benefits those who actually migrate as well as for the left behind household members. Thus, different outcomes in the GDP index between internal migrants and non-migrants are the main result of this motivation to migrate. On the other hand, improvements in education and health status are much more difficult to achieve. For example, even if urban migrants do find jobs that improve their income situation compared to their status before migrating, they often live in urban areas where the access to education and especially to health services is generally very limited. In addition, dwellers urban suburbs often suffer from bad sanitation infrastructure with only very limited access to save drinking water, which might explain the small different in health outcomes between migrants and non-migrants.

4.2 Human Development by migrational status and by region

In the last section we have found that internal migrants, on average, achieve higher MHDI values than non-migrants. In this subsection, we further disaggregate our samples by region to analyze

the migration specific MDHI and the respective sub indices by urban and rural areas. Table 6 shows the migration specific HDI by country and region. We find a clear trend towards higher human development for the internal migrants than non-migrants in rural than in urban areas.

In urban areas, nine countries (Cote d'Ivoire, Ghana, Guinea, Indonesia, Madagascar, Nicaragua, Paraguay, Uganda, and Vietnam) show a higher MHDI value for internal migrants than for non-migrants, resulting in a ratio of migrants to non-migrants of greater than one. However, the differences between the MHDI values of internal migrations and non-migrants are rather small. In Bolivia, Cameroon, Colombia, Guatemala, Kyrgyz Republic, Peru and Zambia, the MDHI is higher for urban non-migrants than for urban internal migrants. With the exception of Guatemala and Zambia this result differs from the overall finding from Table 1. Hence, urban migrants are not much better off than the mean of the whole country. In contrast, in rural areas, 13 countries show a higher MHDI value for the internal migrants than for the non-migrants. Besides Guatemala and Zambia, only in Nicaragua, the rural non-migrants show a higher MDHI than the rural internal migrants.

Additional to the comparison between internal migrants and non-migrants within urban and rural areas, we can also analyze differences in human development between urban migrants and rural non-migrants, addressing the effect of rural-to-urban migration on human development. The last column in Table 6 shows the ratio of the MHDI values of the urban migrants to the rural non-migrants. Urban migrants are better off in 15 of the 16 countries. For example, the largest difference is found for Madagascar, where the ratio is 1.542.

Tables 7 to 9 show the migration specific HDI sub indices by region. Both, for the life expectancy index (Table 7) and for the education index (Table 8), internal migrants achieve, on average, slightly lower values of the indices than the non-migrants in both in rural and in urban areas. Again, the GDP index is higher for the internal migrants than for the non-migrants in almost all countries for rural and urban areas (see, e.g. Williamson, 1990). In almost all countries, urban migrants are richer than rural non-migrants.

Besides analyzing differences between urban migrants and rural migrants, Tables 6 to 9 and Figure 2 and Figure 3 allow to compare outcomes in human development between rural non-migrants, urban non-migrants with the total values of migrants (or urban migrants, rural migrants

and total non-migrants, respectively). When comparing rural and urban non-migrants with total internal migrants two findings emerge. First, comparing rural non-migrants with urban non-migrants, Table 6 and Figure 2 show that non-migrants in urban areas achieve a slightly higher level of human development than non-migrants in rural areas, reflecting the overall urban-rural differences in human development. Second, both rural and urban non-migrants show, on average, lower levels in human development than internal migrants (Figure 2). Again, exceptions are Guatemala, Vietnam, and Zambia.

Figure 3 also shows some interesting results. First, rural internal migrants achieve a higher level of human development than urban internal migrants in almost all countries. Second, only in four countries do urban migrants achieve a higher human development than overall non-migrants (Colombia, Guatemala, Peru, and Zambia).

To summarize the results in section 4, several findings emerge. First, the majority of countries (14 from 16) show a significantly higher overall MHDI for internal migrants than for non-migrants. The differences are sometimes sizeable but generally smaller than the differences in the HDI be income groups. Second, this is reflected by each sub index of the MHDI, while the largest effect on the overall MHDI comes from the GDP index and the lowest effect comes from the life expectancy index. Third, although the education index shows a clear trend towards higher values for internal migrants than non-migrants enrolment rates and literacy rates show reverse values for some countries. Fourth, on average, urban internal migrants are better off than urban non-migrants and rural migrants are better off than rural non-migrants. Fifth, on average, urban migrants are better off than rural migrants and urban non-migrants are also better off than rural non-migrants.

5. Limits and shortcomings of the suggested approach

Computing an index of well-being for different population subgroups is a serious challenge. The exercise is first of all constrained by data availability. In addition there is clearly a trade-off between transparency, simplicity and an intuitive interpretation on the one hand and accuracy and computational complexity on the other hand. In our approach we tried to elaborate an index which is relatively transparent, simple to calculate and easy to interpret. In consequence, we were

forced to make many simplifications. The most important ones are discussed in the following. Hence, the paper should first of all be seen as an illustrative exercise, which hopefully enhances the discussion and sensitizes policy makers for inequality in human development within countries. But it should not be seen by economists and demographers as an attempt to accurately and exactly reflect inequality and income differentials in health and education.

First, as already discussed in Section 2.2, the definition of internal migration is mainly data driven and miss some important information. Related to the data availability, the results should also be treated with cautious in the sense that they are driven by the matching by migrational status of the HIS and DHS data sets, which could be misleading if the share of internal migrants to non-migrants differs substantially in the two surveys. Table A5 shows the respective surveys means for internal migrants and non-migrants. For most of the countries, the differences are quite small, but for some countries (e.g. Indonesia and Peru) the means differ quite a lot.[20]

Second, household income has obviously a different temporal dimension than our indicators for life expectancy and education. Household income as measured in household surveys is clearly a period estimate, even if it is approximated by household expenditure, which could be seen as a rough measure of permanent income. Hence, assuming that people stay at this level throughout life, which is implicitly done the way we use it, is probably false and is likely to overstate lifetime income inequality. Whether this also leads to an overestimation in the differentials of life expectancy and education is unclear.

Third, and finally, the method used here is a comparison of two different population subgroups, i.e. internal migrants and non-migrants. Internal migrants constitute a non-random sample of the population. The endogeneity of the migration decision demands for taking into account a possible selection bias in the empirical analysis of the effect of migration on human well-being. Hence, the findings do not allow drawing any conclusion about causal effects of migration on well-being since it not possible to control for any selection bias in the sample. Thus, the differences found here might not be the reason of the migration process itself and thus, the results should be interpreted in this sense.

[20] One reason for the difference is that most of the DHS data sets include the question about the number of years the individual lives in the place of residence, whereas most of the HIS data sets include the question whether the individual was born in the place of residence, which we took to generate the internal migrational status. See Table A6 for the information in migration available by survey and country.

6. Conclusion

Migration within countries continues to be a very important income diversification strategy, especially for the poor population in developing countries. Thus, to analyze the well-being of migrants is important for the understanding of the socio-economic impact of migration on human development, which could contribute to a better informed and focused policy debate to improve the well-being of migrants and also in the face of interventions to limit migration. This paper contributed to the debate of the differences in well-being between internal migrants and non-migrants by calculating the Human Development Index separately for internal migrants and non-migrants within and across countries and between rural and urban areas.

One of the most often heard critiques of the HDI is that this index does not take into account inequality in its three dimensions within countries. We apply a relatively easy, transparent and intuitive approach which allows computing the three dimension indices and the overall HDI for different population subgroups of the HDI. This allows us to compare the level in human development of the internal migrants with the level of the non-migrants within and across countries and regions.

The illustration for a sample of 16 low and middle income countries showed that differences in human development between internal migrants and non-migrants within countries can be substantial, although generally much smaller than differences in human development by income groups. Internal migrants generally show a higher human development than non-migrants. From 16 developing countries in our sample 14 show a higher value of the HDI for internal migrants than for non-migrants. This is reflected by each sub index of the MHDI, while the largest effect on the overall MHDI comes from the GDP index and the lowest effect comes from the life expectancy index. The results further show that differences in income are generally higher than differences in education and life-expectancy. Disaggregating the analysis by urban and rural areas reveals that urban internal migrants are better off than urban non-migrants and rural migrants are better off than rural non-migrants. In addition, on average, urban migrants are better of than rural migrants and urban non-migrants are also better off than rural non-migrants.

Given the constraints of data availability to analyze the impact of internal migration on human well-being, there arise also some implication for future surveys design and data collection.

Although migration is an important aspect as well as factor of human well-being, detailed information on migration is often missing in existing household survey data. Typically, there is no information on the reasons of migrating in household surveys, i.e. migrating for educational purpose, forced migration, wedding, refugees etc.. One needs to further specify migration subgroups in order to analyze the effect of migration (both internal as well as international) on well-being. This implies that surveys need to include both the reasons for migration as well as the time since migration. The main drawback in current available household surveys that include a migration module is, however, that all these surveys do not allow linking left-behind households with migrating family members. For example, it is not possible to link rural left behind household members to those household members that migrate to urban areas. But linking these households (i.e. by interviewing also the migrating household member, if the interviewed household declare that other household member did migrate) this would be a very important information to know in order to analyze the effects of rural-urban networks, for example, the impact of remittances, and the impact on well-being of both those who actually migrate and the household members left behind.

Despite its shortcomings, we think it can make a useful contribution to the analysis of the impact of migration on human development and should sensitize policy makers to inequality not only in income but also in education and life expectancy which are without any doubt two important determinants of individual well-being. We hope that this paper as well as the discussion of our results in the 2009 Human Development Report will contribute to a debate on these important issues.

References

Anand S. and A. Sen (1992), Human Development Index: Methodology and Measurement. Human Development Report Office Occasional Paper12, UNDP, New York.

Asfar, R. (2003), Internal Migration and the Development Nexus: The Case of Bangladesh, paper presented at the Regional Conference on Migration, Development and Pro-Poor Policy Choices in Asia, Dhaka, Bangladesh, 22-24 June 2003.

Black, R., L. McLean Hilker, and C. Pooley (2004), Migration and Pro-Poor Policy in East Africa, Development Research Centre on Migration, Globalization and Poverty Working paper No. C7, University of Sussex, Brighton.

Brockerhoff, M. (1990), Rural-to-urban migration and child survival in Senegal, *Demography*, 27 (4): 601-616.

Brockerhoff, M. (1995), Child Survival in Big Cities: The Disadvantage of Migrants, *Social Science and Medicine*, 40 (10): 1371-1383.

Coale A.J. and P. Demeny (1983), *Regional model life tables and stable populations*. 2. ed. New York/ London: Academic Press.

Cutler D., A. Deaton and A. Lleras-Muney (2005), The Determinants of Mortality. *Journal of Economic Perspectives*, 20 (3): 97-120.

Deaton A. (2005), Measuring Poverty in a Growing World (or Measuring Growth in a Poor World). *Review of Economics and Statistics*, 87 (1): 1-19.

De Haan, A. (2000), Migrants, Livelihoods, and Rights: The Relevance of Migration in Development Policies, Social Development Working paper No. 4, London, Department for International Development.

Filmer D. and L. Pritchett (1999), The Effect of Household Wealth on Educational Attainment: Evidence from 35 countries. *Population and Development Review*, 25 (1): 85-120.

Foster J.E., L.F. Lopez-Calva und M. Szekely (2003), Measuring the Distribution of Human Development. Mimeo, Vanderbilt University, Nashiville.

Garenne, M. (2003), Migration, Urbanization and Child Health in Africa: A Global Perspective, paper prepared for conference, African Migration in Comparative Perspective, Johannesburg, South Africa, 4-7 June.

Giani, L. (2006), Migration and education: Child migrants in Bangladesh, Sussex Migration Working Paper No. 33, Sussex Centre for Migration Research, University of Sussex.

Grimm, M., K. Harttgen, M. Misselhorn, and S. Klasen (2008), A Human Development Index by Income Groups, *World Development*, 36 (12): 2527-2546.

Harttgen, K. and S. Klasen (2008), Well-being of Migrant Children and Migrant Youth in Europe, Ibero America Institute for Econ. Research (IAI) Discussion Papers No. 181, University of Goettingen.

Hashim, M. (2005), Exploring the Linkages between Children's Independent Migration and Education: Evidence from Ghana, Sussex Centre for Migration Research Working Paper No. T12, University of Sussex.

Hicks D.A. (1997), The inequality-adjusted human development index: a constructive proposal, *World Development*, 28 (8): 1283-1298.

IOM (2005), Migration and the Millennium Development Goals for Health, IOM Migration Research Series No. 1, IOM.

IOM (2005a), Internal Migration and Development: A Global Perspective, IOM Migration Research Series No. 19, IOM.

Kelley A.C. (1991), The Human Development Index: `Handle with Care', *Population and Development Review*, 17 (2): 315-324.

Kiros, G.E. and M.J. White (2004), Migration, community context, and child immunization in Ethiopia, *Social Science and Medicine*, 59 (12): 2606-2616.

Kothari, U. (2002), Migration and Chronic Poverty, Institute for Development Policy and Management Working Paper No. 16, Institute for Development Policy and Management, University of Manchester.

Lagarde, E., M. Schim van der Loeff, C. Enel, B. Holmgren, R. Dray-Spira, G. Pison, J. P. Piau, V. Delaunay, S. M'Boup, I. Ndoye, M. Coeuret-Pellicer, H. Whittle, and P. Aaby (2003), Mobility and the Spread of Human Immunodeficiency Virus into Rural Areas of West Africa, *International Journal of Epidemiology*, 32: 744-752.

Ledermann S. (1969), *Nouvelles tables-types de mortalite*. Travaux et documents, Cahier n. 53, Paris: INED and PUF.

Michaelowa K. (2001), Primary Education Quality in Francophone Sub-Saharan Africa. *World Development*, 29 (10): 1699-1716.

Ranis G., F. Stewart and E. Samman (2006), Human Development: beyond the HDI. QEH Working Paper Series - QEHWPS135.

Ravallion M. (1997), Good and bad growth: The Human Development Reports. *World Development*, 25 (5): 631-638.

Ravallion M. (2001), Should Poverty Measures be Anchored to the National Accounts? *Economic and Political Weekly*, August 26-September 2, 3245-3252.

Sagar A.D. and A. Najam (1998), The Human Development Index: A Critical Review. *Ecological Economics*, 25: 249-264.

Skeldon, R. (2003), Migration and Poverty, Paper presented at the conference on "African Migration and Urbanization in Comparative Perspective, Johannesburg, South Africa, June 4-7, 2003.

Srinivasan T.N. (1994), Human Development: A New Paradigm or Reinvention of the Wheel? *American Economic Review*, 84 (2): 238-243.

UNDP (2008), *Human Development Report 2008*. Fighting climate change: Human solidarity in a divided world. UNDP, New York.

UNICEF (2004), *The State of the World's Children*, UNICEF, New York.

Waddington, C. (2003), Livelihood Outcomes of Migration for Poor People, Development Research Centre on Migration, Globalization and Poverty Working paper No. T1, University of Sussex, Brighton.

Whitehead, A. (2002), Tracking Livelihood Change: Theoretical, Methodological and Empirical Perspectives from North-East Ghana, *Journal of Southern African Studies*, 37 (1&2): 59-82.

Williamson, J.G. (1990), *Coping with city growth in the British industrial revolution*, Cambridge, Cambridge University Press.

World Bank (2008), World Development Indicators, CD-ROM. World Bank, Washington D.C..

Tables and Figures

Table 1

Migration specific HDI by country

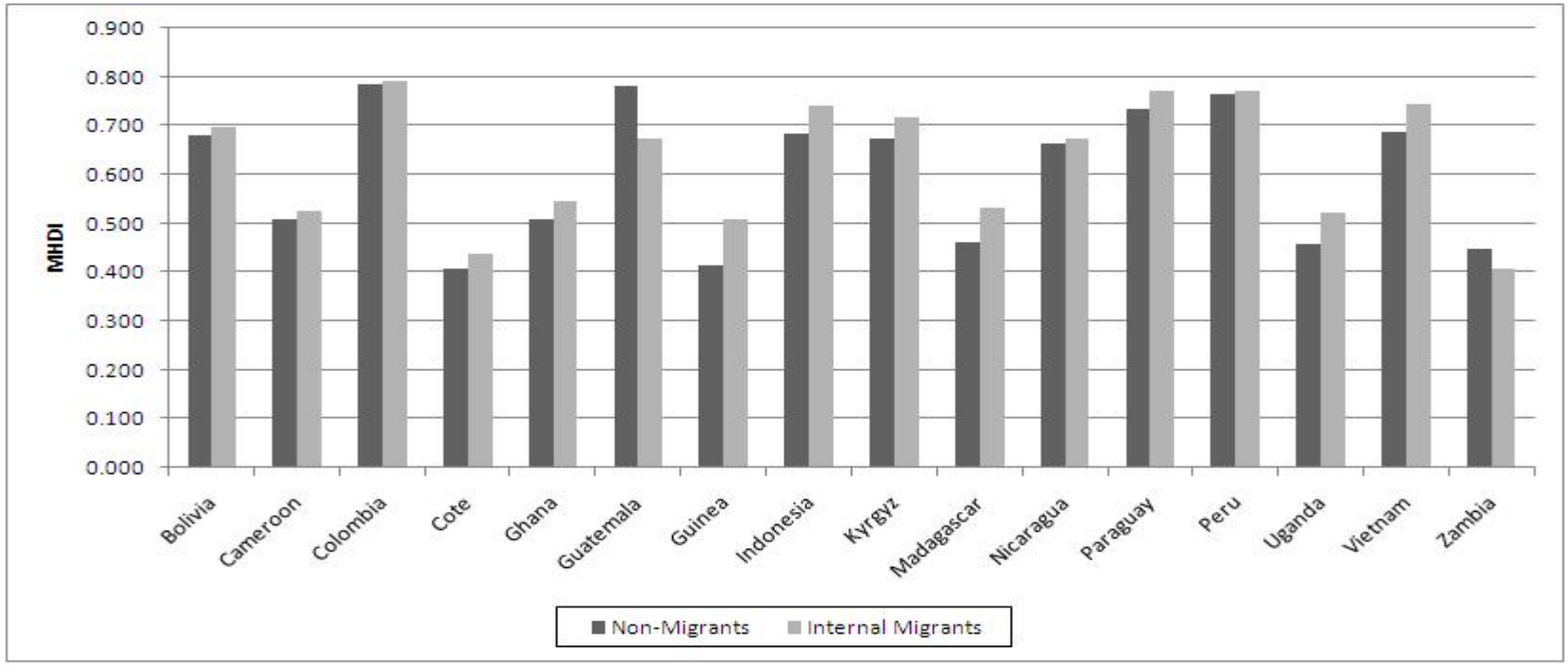
Country	Year	Overall	Non-Migrants	Internal	Ratio	Ranking	Ranking	Ranking
				Migrants	Migrants/	Overall	Non-Migrants	Migrants
					Non-Migrants			
Bolivia	(2002/2003)	0.690	0.680	0.699	1.026	112	114	109
Cameroon	(2004/2004)	0.523	0.508	0.525	1.033	139	145	136
Colombia	(2003/2005)	0.790	0.787	0.793	1.007	76	77	74
Cote d'Ivoire	(1998/1999)	0.430	0.407	0.439	1.079	142	149	138
Ghana	(1999/1998)	0.533	0.511	0.548	1.073	123	123	118
Guatemala	(2000/1995)	0.706	0.784	0.673	0.859	104	58	112

Guinea	(1995/1999)	0.467	0.414	0.510	1.232	134	148	123
Indonesia	(2000/2003)	0.701	0.684	0.741	1.083	110	114	96
Kyrgyz Republic	(1998/1997)	0.694	0.675	0.719	1.065	105	108	94
Madagascar	(2001/1997)	0.488	0.462	0.534	1.155	148	153	134
Nicaragua	(2001/2001)	0.667	0.663	0.672	1.015	115	117	114
Paraguay	(1997/1990)	0.752	0.736	0.772	1.048	68	82	56
Peru	(2001/2000)	0.770	0.766	0.771	1.007	73	75	73
Uganda	(2002/2001)	0.497	0.459	0.524	1.141	142	154	137
Vietnam	(2004/2002)	0.713	0.689	0.744	1.080	108	113	100
Zambia	(2002/2002)	0.426	0.449	0.408	0.909	160	156	162

Note: The years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the second survey year.

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1), Human Development Reports; calculations by the authors.

Figure 1: A human development index by migrational status



Source: Computations by the authors. HDI global scale (HDR 2008).

Table 2: Migration specific GDP indices by country

Country	Year	Overall	Non-Migrants	Internal Migrants	Ratio Migrants/ Non-Migrants
Bolivia	(2002/2003)	0.548	0.540	0.554**	1.025
Cameroon	(2004/2004)	0.513	0.483	0.525**	1.087
Colombia	(2003/2005)	0.711	0.696	0.722**	1.038
Cote d'Ivoire	(1998/1999)	0.483	0.467	0.490**	1.049
Ghana	(1999/1998)	0.421	0.398	0.435**	1.094
Guatemala	(2000/1995)	0.659	0.747	0.609**	0.815
Guinea	(1995/1999)	0.514	0.442	0.560**	1.268
Indonesia	(2000/2003)	0.593	0.575	0.626**	1.089
Kyrgyz Republic	(1998/1997)	0.484	0.468	0.535**	1.143
Madagascar	(2001/1997)	0.370	0.342	0.423**	1.239
Nicaragua	(2001/2001)	0.599	0.575	0.638**	1.110
Paraguay	(1997/1990)	0.617	0.599	0.636**	1.061
Peru	(2001/2000)	0.666	0.653	0.670*	1.027
Uganda	(2002/2001)	0.444	0.382	0.479**	1.252

Vietnam	(2004/2002)	0.543	0.542	0.544	1.001
Zambia	(2002/2002)	0.366	0.411	0.330**	0.805

Note: The stars refer to a significance test for the difference between the outcomes for internal migrants and non-migrants. **(p-value<0.05). *(p-value<0.1). The years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the second survey year.

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1), Human Development Reports; calculations by the authors.

Table 3: Migration specific education indices by country

Country	Year	Overall	Non-Migrants	Internal Migrants	Ratio Migrants/ Non-Migrants
Bolivia	(2002/2003)	0.870	0.856	0.882*	1.030
Cameroon	(2004/2004)	0.713	0.695	0.728*	1.076
Colombia	(2003/2005)	0.863	0.856	0.867**	1.012
Cote d'Ivoire	(1998/1999)	0.443	0.384	0.468**	1.219
Ghana	(1999/1998)	0.605	0.577	0.623*	1.081
Guatemala	(2000/1995)	0.709	0.804	0.671**	0.835
Guinea	(1995/1999)	0.410	0.310	0.493**	1.589
Indonesia	(2000/2003)	0.814	0.788	0.854**	1.083
Kyrgyz Republic	(1998/1997)	0.919	0.916	0.930**	1.002
Madagascar	(2001/1997)	0.593	0.565	0.648*	1.148
Nicaragua	(2001/2001)	0.665	0.665	0.665	0.999
Paraguay	(1997/1990)	0.864	0.864	0.864	1.000
Peru	(2001/2000)	0.894	0.897	0.893	0.996
Uganda	(2002/2001)	0.693	0.641	0.741**	1.156

Vietnam	(2004/2002)	0.831	0.829	0.833	1.005
Zambia	(2002/2002)	0.704	0.719	0.694**	0.965

Note: The stars refer to a significance test for the difference between the outcomes for internal migrants and non-migrants. **(p-value<0.05). *(p-value<0.1). The years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the second survey year.

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1), Human Development Reports; calculations by the authors.

Table 4: Migration specific life expectancy indices by country

Country	Year	Overall	Non-Migrants	Internal Migrants	Ratio Migrants/ Non-Migrants
Bolivia	(2002/2003)	0.651	0.644	0.658**	1.023
Cameroon	(2004/2004)	0.344	0.346	0.344**	0.992
Colombia	(2003/2005)	0.797	0.809	0.789**	0.976
Cote d'Ivoire	(1998/1999)	0.364	0.370	0.360**	0.972
Ghana	(1999/1998)	0.574	0.557	0.584**	1.049
Guatemala	(2000/1995)	0.750	0.800	0.740**	0.926
Guinea	(1995/1999)	0.479	0.489	0.475**	0.973
Indonesia	(2000/2003)	0.697	0.688	0.742**	1.079
Kyrgyz Republic	(1998/1997)	0.678	0.639	0.691**	1.080
Madagascar	(2001/1997)	0.500	0.480	0.530**	1.104
Nicaragua	(2001/2001)	0.735	0.748	0.715**	0.955
Paraguay	(1997/1990)	0.775	0.746	0.815**	1.093
Peru	(2001/2000)	0.749	0.749	0.750*	1.001
Uganda	(2002/2001)	0.353	0.354	0.352*	0.996

Vietnam	(2004/2002)	0.764	0.694	0.854**	1.231
Zambia	(2002/2002)	0.208	0.217	0.200**	0.918

Note: The stars refer to a significance test for the difference between the outcomes for internal migrants and non-migrants. **(p-value<0.05). *(p-value<0.1). The years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the second survey year.

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1), Human Development Reports; calculations by the authors.

Table 5: Descriptive Statistics

Country	Infant Mortality (1q0)			Life expectancy (e0)			Enrolment (age 5-23)			Adult Literacy (aged 15+)			Income/Expenditure (per capita PPP)			
		Non-			Non-			Non-			Non-			Non-		
	Migrants	Migrants	Total	Migrants	Migrants	Total	Migrants	Migrants	Total	Migrants	Migrants	Total	Migrants	Migrants	Total	N
Bolivia	53	56	55	65	64	65	0.846	0.839	0.843	0.880	0.845	0.863	5045	3623	4233	24933
Cameroon	77	75	76	59	60	59	0.762	0.773	0.766	0.888	0.792	0.860	2106	1740	1937	20121
Colombia	22	19	21	76	77	76	0.711	0.719	0.715	0.948	0.929	0.940	6051	3498	4864	84706
Cote d'Iviore	24	20	22	75	77	76	0.752	0.717	0.742	0.533	0.387	0.487	1633	1535	1596	24511
Ghana	59	66	61	64	62	63	0.792	0.809	0.7	0.572	0.490	0.5	948	847	902	159

									99			39				22
Guatemala	43	33	41	68	72	69	0.509	0.617	0.535	0.719	0.858	0.756	4040	5826	4360	37534
Guinea	90	86	89	57	57	57	0.549	0.336	0.458	0.183	0.120	0.152	872	825	835	24054
Indonesia	38	49	47	70	66	67	0.573	0.573	0.573	0.925	0.831	0.867	2747	2287	2416	57388
Kyrgyz Republic	48	59	51	67	63	66	0.653	0.599	0.608	0.990	0.985	0.986	1576	1141	1210	14863
Madagascar	84	99	93	58	55	56	0.707	0.652	0.670	0.816	0.693	0.734	1270	382	693	2756
Nicaragua	37	31	33	70	72	71	0.355	0.356	0.355	0.767	0.767	0.767	2178	2248	2227	22715
Paraguay	28	39	34	73	69	71	0.707	0.729	0.719	0.903	0.892	0.897	3570	3452	3497	17151
Peru	36	36	36	70	70	70	0.555	0.577	0.560	0.898	0.890	0.896	4054	3892	3988	43237

Uganda	84	83	83	58	58	58	0.742	0.616	0.680	0.689	0.609	0.651	814	669	732	51026
Vietnam	44	75	60	67	59	63	0.472	0.710	0.696	0.866	0.772	0.778	1776	1637	1645	39696
Zambia	100	87	94	55	57	56	0.556	0.628	0.583	0.729	0.735	0.734	867	1213	981	54100

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1); calculations by the authors.

Note: Household income/expenditure per capita is rescaled by the ratio between $^{1}y_{PPP}$ and GDP per capita expressed in PPP (taken from the general HDI.

Table 6: Migration specific HDI by country and region

Country		Urban				Rural				
					Ratio				Ratio	Ratio
			Non-		Migrants/		Non-		Migrants/	Urban Migrants/
		Migrants	Migrants	Total	Non-Migrants	Migrants	Migrants	Total	Non-Migrants	Rural Non-Migrants
Bolivia	(2002/2003)	0.706	0.715	0.709	0.987	0.663	0.659	0.660	1.007	1.071
Cameroon	(2004/2004)	0.550	0.566	0.551	0.971	0.510	0.492	0.501	1.037	1.117
Colombia	(2003/2005)	0.803	0.815	0.807	0.985	0.768	0.727	0.752	1.056	1.104
Cote d'Ivoire	(1998/1999)	0.474	0.449	0.468	1.056	0.407	0.389	0.401	1.048	1.219
Ghana	(1999/1998)	0.590	0.587	0.591	1.006	0.525	0.496	0.513	1.057	1.188
Guatemala	(2000/1995)	0.712	0.801	0.744	0.889	0.660	0.688	0.649	0.960	1.036
Guinea	(1995/1999)	0.517	0.503	0.513	1.027	0.422	0.397	0.400	1.063	1.301

Indonesia	(2000/2003)	0.755	0.733	0.742	1.030	0.706	0.663	0.675	1.065	1.138
Kyrgyz Republic	(1998/1997)	0.724	0.731	0.729	0.990	0.736	0.681	0.694	1.081	1.063
Madagascar	(2001/1997)	0.546	0.522	0.529	1.046	0.533	0.354	0.435	1.504	1.542
Nicaragua	(2001/2001)	0.707	0.705	0.706	1.004	0.607	0.633	0.625	0.958	1.117
Paraguay	(1997/1990)	0.789	0.753	0.771	1.047	0.743	0.732	0.736	1.016	1.078
Peru	(2001/2000)	0.777	0.805	0.787	0.965	0.756	0.749	0.752	1.010	1.037
Uganda	(2002/2001)	0.565	0.529	0.555	1.068	0.514	0.468	0.492	1.099	1.206
Vietnam	(2004/2002)	0.774	0.705	0.740	1.098	0.786	0.780	0.783	1.008	0.993
Zambia	(2002/2002)	0.447	0.492	0.467	0.909	0.377	0.389	0.382	0.970	1.150

Note: The years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the second survey year.

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1), Human Development Reports; calculations by the authors.

Table 7: Migration specific life expectancy indices by country and region

Country	Urban					Rural				
					Ratio				Ratio	Ratio
			Non-		Migrants/		Non-		Migrants/	Urban Migrants/
		Migrants	Migrants	Total	Non-Migrants	Migrants	Migrants	Total	Non-Migrants	Rural Non-Migrants
Bolivia	(2002/2003)	0.658	0.644	0.651	1.023	0.587	0.656	0.622	0.896	1.004
Cameroon	(2004/2004)	0.388	0.506	0.409	0.766	0.328	0.347	0.332	0.945	1.117
Colombia	(2003/2005)	0.798	0.834	0.811	0.957	0.769	0.771	0.770	0.997	1.034
Cote d'Ivoire	(1998/1999)	0.370	0.376	0.372	0.984	0.341	0.359	0.348	0.949	1.030
Ghana	(1999/1998)	0.635	0.689	0.655	0.923	0.572	0.526	0.554	1.088	1.209
Guatemala	(2000/1995)	0.744	0.800	0.757	0.931	0.735	0.663	0.673	1.108	1.122
Guinea	(1995/1999)	0.509	0.557	0.523	0.914	0.461	0.478	0.467	0.964	1.065

Indonesia	(2000/2003)	0.748	0.773	0.762	0.968	0.693	0.668	0.670	1.036	1.120
Kyrgyz Republic	(1998/1997)	0.721	0.750	0.742	0.960	0.737	0.655	0.678	1.125	1.100
Madagascar	(2001/1997)	0.560	0.566	0.564	0.990	0.523	0.456	0.483	1.146	1.229
Nicaragua	(2001/2001)	0.730	0.792	0.765	0.922	0.702	0.722	0.715	0.972	1.011
Paraguay	(1997/1990)	0.844	0.754	0.797	1.119	0.793	0.741	0.761	1.070	1.138
Peru	(2001/2000)	0.765	0.854	0.796	0.896	0.733	0.701	0.715	1.045	1.091
Uganda	(2002/2001)	0.394	0.432	0.408	0.913	0.334	0.340	0.337	0.983	1.160
Vietnam[(a)]	(2004/2002)	0.880	0.673	0.776	1.308	1.000	0.993	1.000	1.007	0.886
Zambia	(2002/2002)	0.201	0.229	0.211	0.878	0.199	0.215	0.206	0.927	0.938

Note: The years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set.
All indices are rescaled to UNDP's reported HDI value of the second survey year.
[(a)]As a result of the rescaling, the value for the life expectancy index for Vietnam (for the total index and for the non-migrants) was greater than 1. For a better interpretation, the values were than fixed to 1. This is the reason why the total value and the value for the non-migrants show the same value of the life expectancy index.
Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1), Human Development Reports; calculations by the authors.

Table 8: Migration specific education indices by country and region

Country	Urban					Rural				
					Ratio				Ratio	Ratio
			Non-		Migrants/		Non-		Migrants/	Urban Migrants/
		Migrants	Migrants	Total	Non-Migrants	Migrants	Migrants	Total	Non-Migrants	Rural Non-Migrants
Bolivia	(2002/2003)	0.925	0.943	0.932	0.981	0.797	0.767	0.780	1.039	1.206
Cameroon	(2004/2004)	0.741	0.702	0.731	1.056	0.675	0.634	0.657	1.065	1.168
Colombia	(2003/2005)	0.897	0.905	0.900	0.992	0.784	0.760	0.776	1.032	1.181
Cote d'Ivoire	(1998/1999)	0.566	0.504	0.551	1.124	0.392	0.329	0.370	1.192	1.720
Ghana	(1999/1998)	0.711	0.669	0.699	1.063	0.565	0.548	0.557	1.032	1.298
Guatemala	(2000/1995)	0.782	0.879	0.816	0.890	0.601	0.690	0.617	0.870	1.134
Guinea	(1995/1999)	0.526	0.462	0.507	1.138	0.276	0.198	0.215	1.393	2.652

Indonesia	(2000/2003)	0.889	0.849	0.866	1.047	0.805	0.734	0.758	1.097	1.212
Kyrgyz Republic	(1998/1997)	0.957	0.967	0.963	0.989	0.928	0.918	0.919	1.011	1.042
Madagascar	(2001/1997)	0.684	0.641	0.654	1.068	0.590	0.350	0.450	1.684	1.954
Nicaragua	(2001/2001)	0.757	0.750	0.753	1.009	0.524	0.577	0.561	0.907	1.312
Paraguay	(1997/1990)	0.897	0.899	0.898	0.997	0.816	0.838	0.830	0.974	1.070
Peru	(2001/2000)	0.897	0.902	0.898	0.994	0.867	0.885	0.874	0.980	1.014
Uganda	(2002/2001)	0.842	0.763	0.812	1.104	0.741	0.641	0.693	1.156	1.314
Vietnam	(2004/2002)	0.910	0.897	0.901	1.014	0.808	0.807	0.808	1.002	1.129
Zambia	(2002/2002)	0.813	0.840	0.825	0.967	0.586	0.552	0.574	1.062	1.473

Note: The years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the second survey year.

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1), Human Development Reports; calculations by the authors.

Table 9: Migration specific GDP indices by country and region

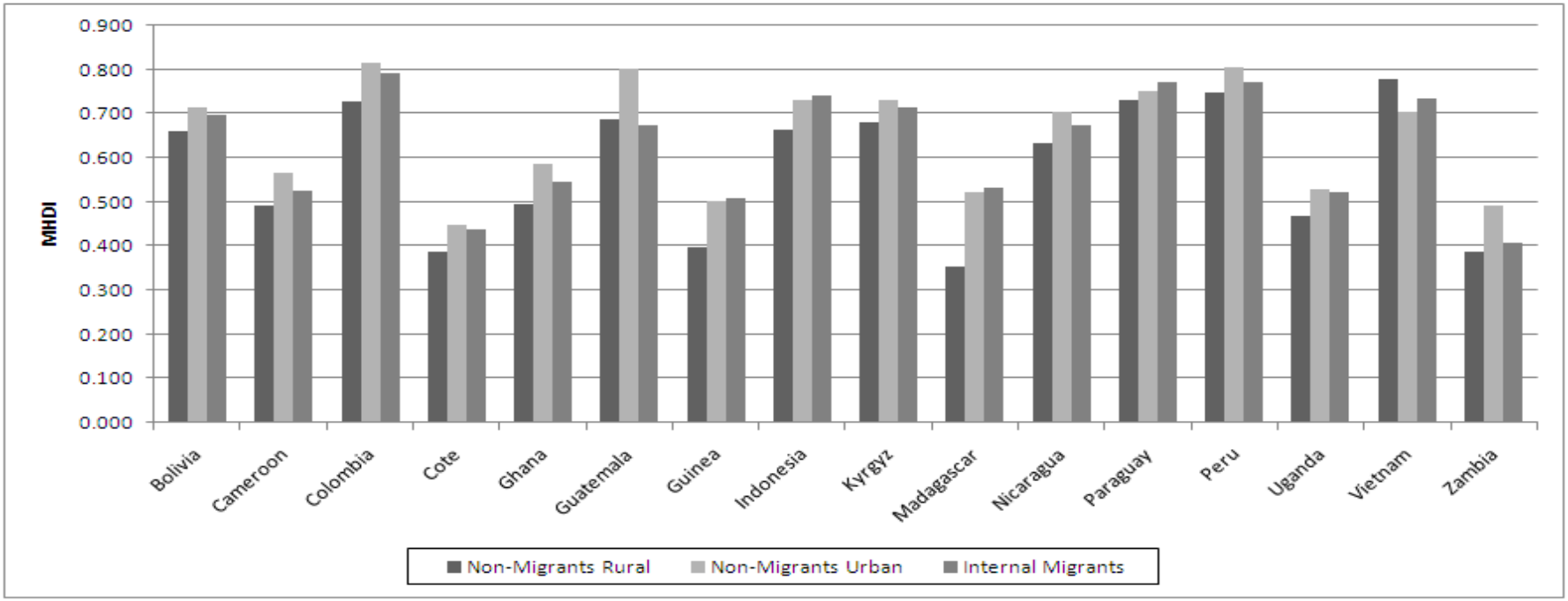
Country	Urban					Rural				
					Ratio				Ratio	Ratio
			Non-		Migrants/		Non-		Migrants/	Urban Migrants/
		Migrants	Migrants	Total	Non-Migrants	Migrants	Migrants	Total	Non-Migrants	Rural Non-Migrants
Bolivia	(2002/2003)	0.535	0.559	0.545	0.957	0.606	0.555	0.579	1.092	0.965
Cameroon	(2004/2004)	0.520	0.490	0.513	1.061	0.527	0.494	0.513	1.067	1.052
Colombia	(2003/2005)	0.714	0.707	0.711	1.010	0.751	0.651	0.711	1.154	1.097
Cote d'Ivoire	(1998/1999)	0.486	0.467	0.481	1.040	0.489	0.478	0.485	1.023	1.016
Ghana	(1999/1998)	0.423	0.402	0.417	1.052	0.438	0.416	0.428	1.053	1.018
Guatemala	(2000/1995)	0.610	0.725	0.659	0.841	0.646	0.710	0.659	0.910	0.860
Guinea	(1995/1999)	0.516	0.491	0.509	1.051	0.530	0.516	0.519	1.027	1.000

Indonesia	(2000/2003)	0.626	0.577	0.597	1.085	0.621	0.587	0.597	1.058	1.067
Kyrgyz Republic	(1998/1997)	0.494	0.476	0.483	1.038	0.543	0.470	0.484	1.155	1.052
Madagascar	(2001/1997)	0.394	0.360	0.370	1.094	0.486	0.257	0.370	1.895	1.537
Nicaragua	(2001/2001)	0.636	0.572	0.599	1.111	0.595	0.601	0.599	0.990	1.058
Paraguay	(1997/1990)	0.625	0.607	0.617	1.031	0.621	0.615	0.617	1.010	1.017
Peru	(2001/2000)	0.669	0.660	0.667	1.014	0.669	0.662	0.666	1.011	1.011
Uganda	(2002/2001)	0.457	0.391	0.444	1.170	0.468	0.424	0.444	1.105	1.079
Vietnam	(2004/2002)	0.532	0.546	0.543	0.975	0.550	0.540	0.543	1.018	0.985
Zambia	(2002/2002)	0.327	0.406	0.366	0.806	0.346	0.400	0.366	0.866	0.817

Note: The years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set.
All indices are rescaled to UNDP's reported HDI value of the second survey year.

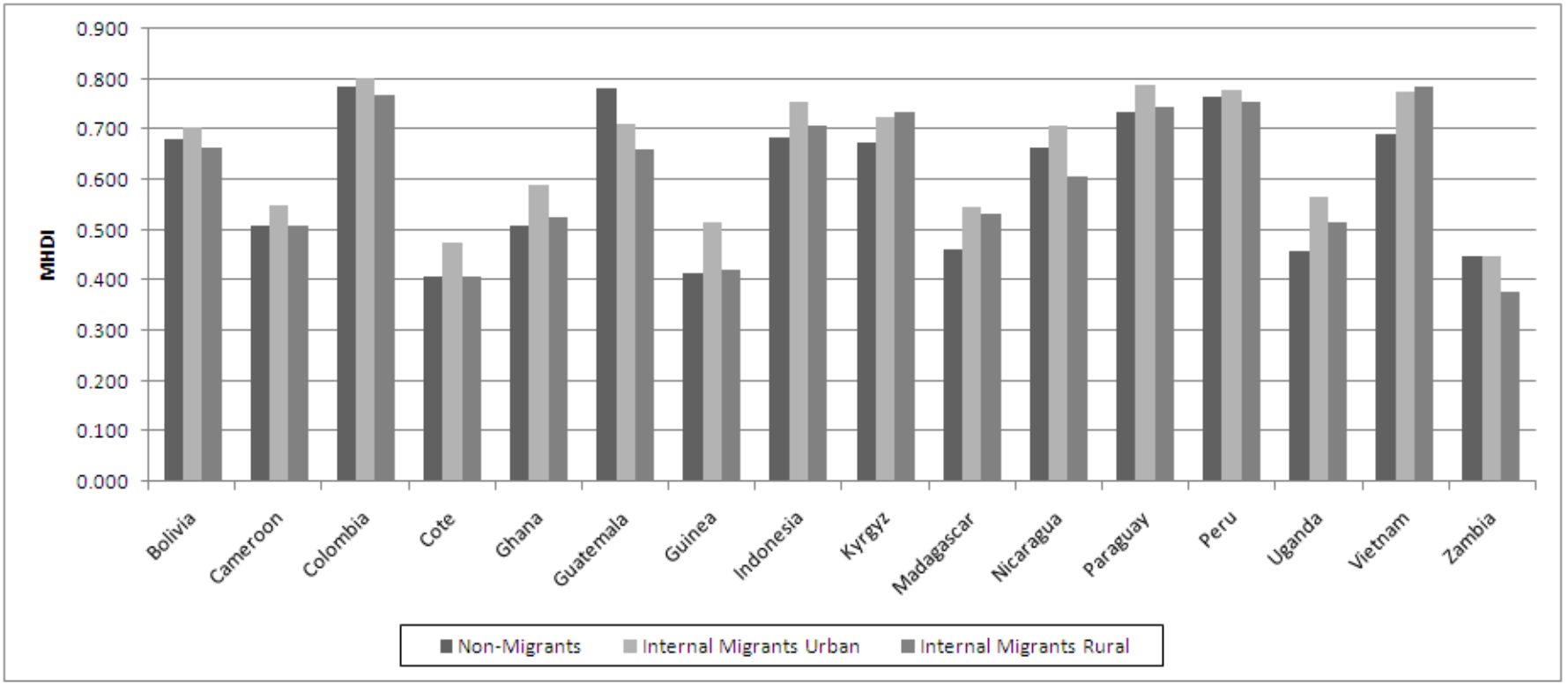
Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1), Human Development Reports; calculations by the authors.

Figure 2: Migration specific HDI for different internal migration subgroups



Source: Computations by the authors. HDI global scale (HDR 2008).

Figure 3: Migration specific HDI for different non-migrant subgroups



Source: Computations by the authors. HDI global scale (HDR 2008).

Table A1: Data sources for developing countries

Country	**Year**	**Type of survey**
Ghana	1998	Demographic and Health Survey (DHS)
	1998	Ghana Living Standard Survey No. 4
Guatemala	1995	Demographic and Health Survey (DHS)
	2000	Living Standard Measurement Survey (LSMS)
Kyrgyz Republic	1997	Demographic and Health Survey (DHS)
	1998	Living Standard Measurement Survey (LSMS)
Paraguay	1990	Demographic and Health Survey (DHS)
	1998	Encueata Integrada De Hogares (Programa MECOVI)
Bolivia	2003	Demographic and Health Survey (DHS)
	2002	Living Standard Measurement Survey (LSMS)
Cote d'Ivoire	1999	Demographic and Health Survey (DHS)
	1998	Enquete de Niveau de Vie des M¶¶enages (ENV)
Guinea	1999	Demographic and Health Survey (DHS)
	1995	Enquete Integrale avec Module Budget et Consummation
Cameroon	2004	Demographic and Health Survey (DHS)

	2001	Enquete Camerounaise auprµes des M¶enages (ECAM)
Colombia	2005	Demographic and Health Survey (DHS)
	2003	Encuesta de Calidad de Vida
Indonesia	2003	Demographic and Health Survey (DHS)
	2000	Demographic and Health Survey (DHS)
Madagascar	1997	Demographic and Health Survey (DHS)
	2001	Enquete auprµes des Menages (EPM)
Nicaragua	2001	Demographic and Health Survey (DHS)
	2001	Encuesta Nacional de Hogares sobre Medicion de Nivel de Vida (EMNV)
Uganda	2001	Demographic and Health Survey (DHS)
	2001	Uganda National Household Survey
Peru	2000	Demographic and Health Survey (DHS)
	1994	Living Standard Measurement Survey (LSMS)
Vietnam	2002	Demographic and Health Survey (DHS)
	2004	Living Standard Measurement Survey (LSMS)
Zambia	2002	Demographic and Health Survey (DHS)
	2002	Living Standard Measurement Survey (LSMS)

Table A2: Education by Country and Survey

Country	Survey	Year	Literacy	Enrollment
Bolivia	HIS	2002	0.863	0.843
	DHS	2003	0.772	0.615
Cameroon	HIS	2004	0.860	0.766
	DHS	2004	0.619	0.609
Colombia	HIS	2005	0.940	0.715
	DHS	2003	0.778	0.653
Cote d'Ivoire	HIS	2003	0.487	0.742
	DHS	1998	0.390	0.257
Ghana	HIS	1999	0.539	0.799
	DHS	1998	0.573	0.492
Guatemala	HIS	2000	0.756	0.535
	DHS	1995	0.330	0.398
Guinea	HIS	1995	0.152	0.458
	DHS	1999	0.204	0.401
Indonesia	HIS	2000	0.867	0.573
	DHS	2003	0.708	0.588

Kyrgyz Republic	HIS	1998	0.986	0.608
	DHS	1997	0.964	0.573
Madagascar	HIS	2001	0.734	0.670
	DHS	1997	0.366	0.362
Nicaragua	HIS	2001	0.767	0.355
	DHS	2001	0.543	0.344
Paraguay	HIS	1997	0.897	0.719
	DHS	1990	n.a.	n.a.
Peru	HIS	2001	0.896	0.560
	DHS	2000	0.805	0.677
Uganda	HIS	2002	0.651	0.680
	DHS	2001	0.566	0.601
Vietnam	HIS	2004	0.778	0.696
	DHS	2002	0.770	0.675
Zambia	HIS	2002	0.734	0.583
	DHS	2002	0.674	0.436

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1); calculations by the authors.

Table A3: Migration specific education indices by country (based on DHS data)

Country	Year	Overall	Non-Migrants	Internal Migrants	Ratio Migrants/ Non-Migrants
Bolivia	(2002/2003)	0.870	0.875	0.865**	0.989
Cameroon	(2004/2004)	0.713	0.584	0.748**	1.281
Colombia	(2003/2005)	0.863	0.854	0.869**	1.017
Cote d'Ivoire	(1998/1999)	0.443	0.476	0.431	0.907
Ghana	(1999/1998)	0.605	0.584	0.617**	1.057
Guatemala	(2000/1995)	0.709	0.964	0.651**	0.675
Guinea	(1995/1999)	0.410	0.342	0.477**	1.395
Indonesia	(2000/2003)	0.814	0.791	0.913**	1.154
Kyrgyz Republic	(1998/1997)	0.919	0.901	0.945**	1.049
Madagascar	(2001/1997)	0.593	0.560	0.643**	1.148
Nicaragua	(2001/2001)	0.665	0.656	0.680*	1.036
Paraguay	(1997/1990)	n.a.	n.a.	n.a.	n.a.
Peru	(2001/2000)	0.894	0.868	0.916**	1.055
Uganda	(2002/2001)	0.693	0.667	0.713*	1.069

Vietnam	(2004/2002)	0.831	0.808	0.858**	1.062
Zambia	(2002/2002)	0.704	0.629	0.760**	1.209

Note: The stars refer to a significance test for the difference between the outcomes for internal migrants and non-migrants. **(p-value<0.05). *(p-value<0.1). The years in brackets refer to the respective survey years. The first year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the second survey year.

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1), Human Development Reports; calculations by the authors.

Table A4: Migration specific HDI index by country (Education index based on DHS data)

Country	Year	Overall	Non-Migrants	Internal Migrants	Ratio Migrants/ Non-Migrants
Bolivia	(2002/2003)	0.690	0.686	0.692	1.009
Cameroon	(2004/2004)	0.523	0.471	0.539	1.144
Colombia	(2003/2005)	0.790	0.786	0.793	1.009
Cote d'Ivoire	(1998/1999)	0.430	0.438	0.427	0.976
Ghana	(1999/1998)	0.533	0.513	0.545	1.063
Guatemala	(2000/1995)	0.706	0.837	0.667	0.796
Guinea	(1995/1999)	0.467	0.424	0.504	1.189
Indonesia	(2000/2003)	0.701	0.684	0.760	1.111
Kyrgyz Republic	(1998/1997)	0.694	0.669	0.724	1.082
Madagascar	(2001/1997)	0.488	0.461	0.532	1.155
Nicaragua	(2001/2001)	0.667	0.660	0.677	1.027
Paraguay	(1997/1990)	n.a.	n.a.	n.a.	n.a.
Peru	(2001/2000)	0.770	0.757	0.779	1.029
Uganda	(2002/2001)	0.497	0.468	0.514	1.100

Vietnam	(2004/2002)	0.713	0.682	0.751	1.102
Zambia	(2002/2002)	0.426	0.419	0.430	1.026

Note: The years in brackets refer to the respective survey years. The ¯rst year refers to the HIS data set, the second to the DHS data set. All indices are rescaled to UNDP's reported HDI value of the second survey year.

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1), Human Development Reports; calculations by the authors.

Table A5: Descriptive Statistics by Country and Region

Country	Survey	Year	Total		Urban		Rural	
			Internal Migrants	Non-Migrants	Internal Migrants	Non-Migrants	Internal Migrants	Non-Migrants
Bolivia	HIS	2002	52.56	47.44	59.62	40.38	42.82	57.18
	DHS	2003	50.87	49.13	52.47	47.53	46.92	53.08
Cameroon	HIS	2004	70.43	29.57	75.78	24.22	56.80	43.20
	DHS	2004	75.74	24.26	77.52	22.48	74.12	25.88
Colombia	HIS	2005	57.26	42.74	52.37	47.63	65.20	34.80
	DHS	2003	55.55	44.45	57.57	42.43	49.39	50.61
Coted 'Iviore	HIS	1998	68.42	31.58	70.56	29.44	67.51	32.49
	DHS	1999	59.89	40.11	59.69	40.31	60.47	39.53
Ghana	HIS	1999	57.03	42.97	66.30	33.70	52.30	47.70
	DHS	1998	59.30	40.70	60.82	39.18	58.58	41.42
Guatemala	HIS	2000	72.63	27.37	62.58	37.42	81.47	18.53
	DHS	1995	36.99	63.01	83.49	16.51	16.49	83.51
Guinea	HIS	1995	53.25	46.75	72.79	27.21	20.67	79.33
	DHS	1999	46.06	53.94	63.87	36.13	39.45	60.55

Indonesia	HIS	2000	37.29	62.71	42.87	57.13	32.34	67.66
	DHS	2003	21.44	78.56	48.85	51.15	9.84	90.16
Kyrgyz Republic	HIS	1998	26.80	73.20	43.59	56.41	19.20	80.80
	DHS	1997	34.65	65.35	30.30	69.70	37.45	62.55
Madagascar	HIS	2001	30.56	69.44	29.17	70.83	33.33	66.67
	DHS	1997	36.59	63.41	35.88	64.12	36.90	63.10
Nicaragua	HIS	2001	34.24	65.76	37.90	62.10	29.59	70.41
	DHS	2001	35.27	64.73	38.03	61.97	32.20	67.80
Paraguay	HIS	1997	46.81	53.19	55.13	44.87	38.60	61.40
	DHS	1990	43.94	56.06	48.00	52.00	40.13	59.87
Peru	HIS	2001	74.98	25.02	78.83	21.17	57.18	42.82
	DHS	2000	51.62	48.38	57.89	42.11	43.17	56.83
Uganda	HIS	2002	57.20	42.80	76.81	23.19	43.10	56.90
	DHS	2001	61.10	38.90	62.57	37.25	43.48	56.52
Vietnam	HIS	2004	45.02	54.98	40.86	59.14	46.33	53.67
	DHS	2002	44.99	55.01	55.33	44.67	42.01	57.99
Zambia	HIS	2002	68.86	31.14	65.02	34.98	72.44	27.56
	DHS	2002	52.36	47.64	61.90	38.10	48.28	51.72

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1); calculations by the authors.

Table A6: Information in migration by country and survey

Country	Survey	Year	Variable on migrational status
Bolivia	HIS	2002	Place of birth
	DHS	2003	Place of birth
Cameroon	HIS	2004	Born in place of residence?
	DHS	2004	Years lived in place of residence
Colombia	HIS	2005	Born in place of residence?
	DHS	2003	Years lived in place of residence
Coted 'Iviore	HIS	1998	Born in place of residence?
	DHS	1999	Years lived in place of residence
Ghana	HIS	1999	Born in place of residence?
	DHS	1998	Years lived in place of residence
Guatemala	HIS	2000	Born in place of residence?
	DHS	1995	Years lived in place of residence
Guinea	HIS	1995	Born in place of residence?
	DHS	1999	Years lived in place of residence
Indonesia	HIS	2000	Born in place of residence?
	DHS	2003	Years lived in place of residence

Kyrgyz Republic	HIS	1998	Born in place of residence?
	DHS	1997	Years lived in place of residence
Madagascar	HIS	2001	Born in place of residence?
	DHS	1997	Years lived in place of residence
Nicaragua	HIS	2001	Born in place of residence?
	DHS	2001	Years lived in place of residence
Paraguay	HIS	1997	Born in place of residence?
	DHS	1990	Years lived in place of residence
Peru	HIS	2001	Born in place of residence?
	DHS	2000	Years lived in place of residence
Uganda	HIS	2002	Born in place of residence?
	DHS	2001	Years lived in place of residence
Vietnam	HIS	2004	Born in place of residence?
	DHS	2002	Years lived in place of residence
Zambia	HIS	2002	Years lived in place of residence
	DHS	2002	Years lived in place of residence

Source: Household Income Survey (HIS) and Demographic and Health Surveys (DHS) (see Table A1). *Note:* Most HIS data sets include the information whether the different place of residence is also in a different district. Exceptions are Cameroon, Ghana, Kyrgyz Republic, and Zambia where information is only available on whether the current place of living differs from the place of birth. Most HIS data sets also contain information to distinguish internal migrants and international migrants. Exceptions are Cameroon, Peru, Vietnam, and Zambia. The DHS data sets contain no information on whether the previous place of residence is in a different district nor whether it is abroad.