**Can International Migration Accelerate Development?**

**A Global Dynamic General Equilibrium Analysis**

S. Amer Ahmed

*The World Bank*

Delfin S. Go

*The World Bank (Emeritus)*

Dirk Willenbockel

*Institute of Development Studies at the University of Sussex / The World Bank*

June 2015

Preliminary Draft (Rev 3.0)

EcoMod 2015 - International Conference on Economic Modeling

Boston MA, 15-17July 2015

1. **Motivation and Policy Background**

It has been suggested that policies to facilitate international migration and targets for reductions in remittance costs faced by migrant workers should be part of the emerging post-2015 development agenda. This is a recognition of significant linkages between international migration and the achievement of development goals, and is a response to the fact that total remittance flows to developing countries are already a multiple of international development assistance flows. Global demographic shifts over the coming decades are bound to magnify the economic incentives for South-North migration and reinforce the economic case for a reduction of existing barriers to international labor mobility. The domestic labor supply has already peaked in high-income countries as a whole. It is set to decline steadily over coming decades while hundreds of millions of new workers are projected to enter the labor force by 2030 in developing countries as a group. Moreover, given the considerable variety in demographic dynamics and labor productivity levels across developing regions, there is potentially also considerable scope for mutual gains from further South-South migration. Correspondingly, forward-looking assessments of the prospective economic impacts of future changes in policies toward cross-border migration flows deserve a high priority on the global development research agenda.

Existing rough estimates suggest that the potential net benefits from reducing barriers to migration are huge and a multiple of the gains from further trade liberalization. As Clemens (2011) puts it bluntly, “(r)esearch on this question has been distinguished by its rarity and obscurity, but the few estimates we have should make economists’ jaws hit their desks”, as these benefits “may be much larger than those available through any other shift in a single class of global economic policy”.

Studies of gains from further international labor migration based on global computable general equilibrium (CGE) models (e.g. Walmsley and Winters, 2005; World Bank, 2006; Walmsley et al., 2007, van der Mensbrugghe and Roland-Holst, 2009) focus predominantly on South-North migration impacts, and a first aim of the present study is to provide an update of these estimates using more recent and higher-quality data.

However, in terms of absolute headcount figures, the present observed extent of South-South migration is nearly as large as that of South-North migration (UNESA, 2012; Ratha and Shaw, 2007; Bakewell, 2009). Heterogeneity in demographic trends, as well as wage differentials across regions *within* the “Global South” suggest non-trivial potential gains from further South-South migration. Thus, a second aim of the present study is to obtain a broad indication of the order of magnitude of aggregate welfare impacts associated with current levels of international labor migration among low- and middle-income countries.

The analytical framework is an extended version of the World Bank’s recursive dynamic global CGE model LINKAGE. The following section provides a brief outline of the model with a focus on the treatment of international migration and remittance flows. The model is calibrated to the GMig2 extension of the GTAP 8.1 database, which contains the latest available model-consistent global estimates of bilateral labor migration stocks, labor earnings and remittance flows for the benchmark year 2007 (Walmsley et al, 2013) and then used to generate a dynamic baseline scenario up to 2030, in which the benchmark composition of the labor force by worker origin remains frozen. Section 3 describes key features of this baseline equilibrium with respect to international labor migration patterns, wage distributions and remittance flows. Section 4 compares the baseline with two alternative international migration scenarios. The first scenario considers a gradual exogenous increase in labor migration from low-and middle income (LMI) regions to high-income (HI) regions and is designed to provide a modified update of the South-North migration scenario presented in World Bank (2006). It is assumed that existing binding restrictions on LMI-HI migration to each of the HI regions are relaxed such that the total labor force in each of the host regions rises eventually by 3 percent relative to the baseline. The second is a hypothetical extreme reverse South-South migration scenario, in which eventually 90 percent of all baseline LMI-LMI migrants return to their origin country. Section 5 draws conclusions.

1. **Analytical Framework**
   1. **The LINKAGE Model: Overview**

The analytical framework is a modified version of the World Bank’s recursive dynamic global CGE model LINKAGE (van der Mensbrugghe, 2011). An earlier version of this model has been used in an assessment of potential gains from further international migration reported in the World Bank Global Economic Prospects Report 2006. The new version of the model used in the present study is calibrated to the recent GMig2 extension of the GTAP 8.1 database, which contains the latest available model-consistent estimates of bilateral migration stocks, labor earnings and remittance flows at GTAP 8.1 regional aggregation level as described in Walmsley et al (2013).

Household demand behavior is modeled using the Constant Difference of Elasticities (CDE) demand system. Bilateral trade flows among the model regions are governed by a standard two-level Armington specification. Non-agricultural technologies are described by multi-level nested CES functions. At the top of the nesting structure, an aggregate of non-energy intermediate inputs is combined with a value added- energy composite under a Leontief technology. At the next levels, unskilled labor is substitutable for a skilled-labor-capital-energy composite, energy is substitutable for a skilled-labor-capital composite, and skilled labor is substitutable for capital with a fairly low elasticity of substitution, so that effectively labor-capital substitutability is higher for unskilled labor than for skilled labor. The model takes a semi-putty-clay vintage approach to capital in production with a distinction between ‘old capital’ and ‘new capital’, whereby old capital is far less substitutable for other primary factors than new capital.

Investment is driven by savings. Households save a variable fraction of income, whereby the average propensity to save is a function of per-capita GDP growth, dependency ratios and the real return to capital. Government expenditure is a fixed share of GDP and direct tax rates vary endogenously to establish government revenue-expenditure balance. Current-account balances are exogenous and are gradually reduced from their initial benchmark levels over time.

* 1. **International Migrant Labour and Remittances in LINKAGE**

The specification of labor demand by region of origin adopts a three-level nesting structure following World Bank (2006) and van der Mensbrugghe and Roland-Holst (2009). At the top level, region r’s demand for composite labor of skill type l in sector i (Lr,l,i) is derived from cost-minimizing behavior subject to the technology constraints and is thus a function of output level and the relation of the top-level wage indices (Wr,l,i dual to Lr,l,i) to other relevant factor prices.

The Lr,l,i aggregates are CES composites of two second-level labor aggregates LOr,l,i,s, s ∈ {ntc, fbn}. The ntc composites comprise native workers and international migrant workers classified as relatively close substitutes for native workers, while the fbn composite comprises international migrant workers classified as less close substitutes for domestic labor. Specifically, for high-income host regions, migrants from other high-income regions are grouped together with native labor in the ntc (native and close substitutes) nest, while the fbn (other foreign-born) nest comprises migrants from other regions of origin – and vice versa for low- and middle-income host regions. For composite model regions, native workers are the native workers of the corresponding sub-regions while intra-region migrants are treated as a separate category in the same ntc nest. Formally, region r’s optimal demand for the ntc and fbn aggregates by sector and labor type takes the form

, s ∈ {ntc, fbn}, l ∈ {SkL,UnSkL}, (1)

where the WO are the wage indices dual to the LO and the σl are the elasticities of substitution between labor of ntc and fbn origin.

Region r’s economy-wide demand for these labor bundles is then given by

. (2)

The LOT bundles are in turn CES composites over labor from the origin regions classified as ntc or fbn via a set mapping from origin regions rt to s for each host region r denoted by maps(r,s,rt).

The optimal bottom-level demands in region r for l-type labor of origin rt thus takes the form

, s ∈ maps(r,s,rt), (3)

where WRTr,l,rt is the corresponding wage rate, σlzr,l,s denotes the elasticity of substitution between type-l labor from different regions of origin within nest s, and the lameff are labor efficiency parameters that serve to explain the ‘observed’ initial wage differentials across workers of different origin in the benchmark data set.

The fact that the labor demand by origin in the model is determined at the economy-wide rather than at the sectoral level is dictated by the absence of information on the sectoral allocation of migrant workers in the database.

The model keeps track of changes in the total populations in host and origin regions due to exogenous changes in migrant flows by assuming that the ratio of migrating people including accompanying dependents to migrating workers is the same as the baseline ratio of total migrants to migrant workers of the same origin in the host region.

Household remittances from the host region to the region of origin are fixed fractions of migrant workers’ labor income.

* 1. **Regional and Sectoral Aggregation**

The aggregation of the GTAP 8.1/ GMig2 database employed in this study distinguishes 24 regions as displayed in Table 1 and 7 production sectors (Agriculture, Oil and Gas Extraction, Other Natural Resource Extraction, Food Processing, Other Manufacturing, Electricity and Gas Distribution and Other Services). The selection of the regional aggregation aims to balance tractability with the desire to separately capture major migration corridors, to separate high-income regions from other regions and to separate as far as possible low-income regions from middle-income regions.

**Table 1: Regional Aggregation**

|  |  |  |
| --- | --- | --- |
| **No.** | **Short Code** | **Description** |
| 1 | USA | United States of America |
| 2 | Canada | Canada |
| 3 | Mexico | Mexico |
| 4 | Brazil | Brazil |
| 5 | OLAC | Other Latin America and Caribbean |
| 6 | China | China |
| 7 | India | India |
| 8 | Pakistan | Pakistan |
| 9 | Bangladesh | Bangladesh |
| 10 | Indonesia | Indonesia |
| 11 | HI\_Asia | High-Income Asia |
| 12 | OMI\_Asia | Other Middle-Income Asia |
| 13 | OLI\_Asia | Other Low-Income South and East Asia |
| 14 | CtrlAsia | Central Asia |
| 15 | HI\_MENA | High-Income Middle East |
| 16 | MI\_MENA | Middle-Income Middle East and North Africa |
| 17 | Turkey | Turkey |
| 18 | Russia | Russian Federation |
| 19 | OFSU\_OEE | Other Former Soviet Union and Other Eastern Europe |
| 20 | EEA | European Economic Area |
| 21 | SthAfrica | South Africa |
| 22 | OMI\_SSA | Other Middle-Income Sub-Saharan Africa |
| 23 | LI\_SSA | Low-Income Sub-Saharan Africa |
| 24 | Oceania | Australia, New Zealand and Other Oceania |

1. **Dynamic Baseline Scenario**

In a first stage, the model is calibrated to the aggregated GMig2 extension of the GTAP 8.1 database for the benchmark year 2007 and then used to generate a dynamic baseline (BaU) projection up to 2030. The GMig2 database contains economy-wide headcount estimates of skilled and unskilled workers by origin and host region in 2007 for each of the 134 GTAP 8.1 regions as well as estimates of the associated 134-by-134 matrices of wage bills and remittance flows for the benchmark year. The wage bill totals by host country and skill class match the corresponding totals of the standard GTAP 8.1 database. In addition, GMig2 provides total population headcounts by region of origin and residence.

The baseline population and labor force paths are drawn from the UNDESA medium variant projections and the labor productivity parameters are calibrated residually so that the baseline scenario replicates World Bank real GDP projections. The exogenous baseline migrant worker stocks by host region and origin are assumed to evolve in proportion to host regions’ given total labor force path, i.e. the 2007 benchmark shares of workers by origin and skill class in each host region’s total labor force are preserved.

Table 2 displays the resulting baseline composition of the labor force by origin in 2030 in headcount terms for the model’s high-income host countries, while Table 3 reports the corresponding figures for unskilled workers. Thus, in the BaU scenario the high-income (HI) regions as a whole host 36.6 million migrant workers of low- and middle-income country (LMI) origin (up from 33.8 million in 2007), of which 26.3 million are unskilled workers. The overall share of LMI migrants in the total HI labor force share remains constant at 5.7 percent in this scenario.

Tables 4 and 5 report the average annual gross wage earnings per worker by region of origin for the HI host regions in the benchmark year as implied by the wage bill and worker headcount matrices of the GMig2 database. The last column of these tables shows the corresponding wage for native non-migrants in the origin regions.

Table 6 provides some summary information on South-South migrant worker stocks in the benchmark year. The total stock of LMI-to-LMI migrant workers reported in the GMig2 database amounts to 15.7 million workers in 2007 and this figure is projected to rise to 23.5 million workers by 2030 under the maintained baseline assumption that the composition of the labor force by origin in host regions does not change. In terms of absolute size, the main origin regions in the benchmark year are LI\_SSA, India, Bangladesh and OLAC. The main LMI destination regions for LI\_SSA South-South migrant labour are other LI\_SSA and OMI\_SSA countries (93 percent), the main LMI destination for Indian migrant labour is Pakistan (53 percent), the main LMI destination for Bangladeshi migrant workers is India (95 percent) and most intra- LMI migrant workers go to other OLAC countries (90 percent).

While part of the observed South-South labor migration may arguably not be primarily motivated by earning differentials between home and host country, it should be noted that according to the GMig2 database the average wage earnings of a South-South migrant along the aforementioned migration corridors are in most cases significantly higher than the average wage earnings of a native non-migrant in the origin region. For example, the average annual gross wage of an unskilled (skilled) intra LI\_SSA migrant is 33.5 (58.7) percent higher than that of the corresponding average LI\_SSA non-migrant. The corresponding wage differentials for unskilled (skilled) LI\_SSA migrants to OMI\_SSA are +146.7 (+87.9) percent, +120.0 (+6.9) percent for Bangladeshi migrants in India, and +18.5 (+11.3) for intra-OLAC migrants. A partial exception is the case of Indian unskilled workers in Pakistan with migrant/non-migrant wage differentials of -1.0 and +2.5 percent for unskilled and skilled workers respectively.

**Table 2: Total Labor Force by Origin and High-Income Host Region – BaU 2030**

*Million workers (skilled and unskilled)*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **USA** | **Canada** | **EEA** | **HI\_Asia** | **Russia** | **Oceania** | **HI\_MENA** | **Total HI** |
| **Native** | 152.871 | 16.853 | 219.013 | 91.042 | 59.780 | 19.646 | 23.336 | 582.541 |
| **USA** |  | 0.157 | 0.335 | 0.044 | 0.000 | 0.066 | 0.110 | 0.713 |
| **Canada** | 0.583 |  | 0.102 | 0.008 | 0.000 | 0.026 | 0.003 | 0.723 |
| **EEA** | 2.713 | 1.136 | 7.454 | 0.036 | 0.284 | 1.525 | 0.512 | 13.661 |
| **HI\_Asia** | 1.083 | 0.239 | 0.249 | 0.313 | 0.000 | 0.149 | 0.001 | 2.034 |
| **Russia** | 0.013 | 0.031 | 0.570 | 0.002 |  | 0.013 | 0.390 | 1.019 |
| **Oceania** | 0.145 | 0.028 | 0.158 | 0.009 | 0.000 | 0.469 | 0.011 | 0.819 |
| **HI\_MENA** | 0.077 | 0.024 | 0.027 | 0.001 | 0.000 | 0.010 | 0.317 | 0.455 |
| **Mexico** | 4.590 | 0.021 | 0.015 | 0.002 | 0.009 | 0.001 | 0.000 | 4.639 |
| **Brazil** | 0.126 | 0.008 | 0.099 | 0.108 | 0.000 | 0.004 | 0.013 | 0.357 |
| **OLAC** | 3.899 | 0.277 | 0.841 | 0.024 | 0.009 | 0.047 | 0.041 | 5.136 |
| **China** | 0.667 | 0.224 | 0.256 | 1.474 | 0.001 | 0.178 | 0.002 | 2.801 |
| **India** | 0.480 | 0.147 | 0.344 | 0.044 | 0.000 | 0.067 | 1.886 | 2.967 |
| **Pakistan** | 0.087 | 0.031 | 0.191 | 0.007 | 0.000 | 0.006 | 0.968 | 1.291 |
| **Indonesia** | 0.044 | 0.006 | 0.113 | 0.047 | 0.000 | 0.035 | 0.301 | 0.547 |
| **OMI\_Asia** | 1.356 | 0.240 | 0.374 | 0.384 | 0.002 | 0.298 | 0.465 | 3.120 |
| **Bangladesh** | 0.044 | 0.011 | 0.105 | 0.012 | 0.000 | 0.006 | 0.468 | 0.646 |
| **OLI\_Asia** | 0.244 | 0.034 | 0.099 | 0.424 | 0.002 | 0.048 | 0.128 | 0.979 |
| **CtrlAsia** | 0.036 | 0.004 | 0.035 | 0.001 | 2.202 | 0.001 | 0.379 | 2.658 |
| **MI\_MENA** | 0.295 | 0.100 | 0.963 | 0.003 | 0.004 | 0.073 | 2.276 | 3.714 |
| **Turkey** | 0.034 | 0.006 | 1.197 | 0.001 | 0.000 | 0.013 | 0.072 | 1.323 |
| **OFSU\_OEE** | 0.456 | 0.054 | 1.609 | 0.001 | 2.450 | 0.052 | 0.191 | 4.812 |
| **OMI\_SSA** | 0.112 | 0.024 | 0.327 | 0.001 | 0.001 | 0.017 | 0.007 | 0.489 |
| **LI\_SSA** | 0.161 | 0.054 | 0.443 | 0.001 | 0.002 | 0.027 | 0.297 | 0.987 |
| **SthAfrica** | 0.029 | 0.016 | 0.083 | 0.000 | 0.000 | 0.054 | 0.000 | 0.181 |
| **Total** | 170.144 | 19.723 | 235.001 | 93.990 | 64.746 | 22.832 | 32.176 | 638.612 |
| **Migrants All** | 17.273 | 2.871 | 15.988 | 2.948 | 4.966 | 3.186 | 8.840 | 56.072 |
| **LMI Origin** | 12.659 | 1.255 | 7.092 | 2.535 | 4.682 | 0.928 | 7.497 | 36.647 |
| **Mig Shares**  **Migrants All** | 10.2 | 14.6 | 6.8 | 3.1 | 7.7 | 14.0 | 27.5 | 8.8 |
| **LMI Origin** | 7.4 | 6.4 | 3.0 | 2.7 | 7.2 | 4.1 | 23.3 | 5.7 |

**Table 3: Unskilled Labor Force by Origin and High-Income Host Region – BaU 2030**

*Million workers*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **USA** | **Canada** | **EEA** | **HI\_Asia** | **Russia** | **Oceania** | **HI\_MENA** | **Total HI** |
| **Native** | 99.862 | 11.195 | 137.985 | 60.459 | 40.569 | 14.162 | 17.343 | 381.576 |
| **USA** |  | 0.043 | 0.137 | 0.010 | 0.000 | 0.011 | 0.057 | 0.259 |
| **Canada** | 0.225 |  | 0.046 | 0.001 | 0.000 | 0.007 | 0.001 | 0.281 |
| **EEA** | 1.245 | 0.522 | 5.618 | 0.014 | 0.199 | 0.959 | 0.356 | 8.912 |
| **HI\_Asia** | 0.322 | 0.071 | 0.145 | 0.236 | 0.000 | 0.051 | 0.001 | 0.825 |
| **Russia** | 0.005 | 0.008 | 0.382 | 0.001 |  | 0.005 | 0.181 | 0.581 |
| **Oceania** | 0.061 | 0.009 | 0.080 | 0.003 | 0.000 | 0.273 | 0.005 | 0.431 |
| **HI\_MENA** | 0.025 | 0.004 | 0.017 | 0.000 | 0.000 | 0.003 | 0.257 | 0.307 |
| **Mexico** | 3.928 | 0.011 | 0.008 | 0.001 | 0.008 | 0.000 | 0.000 | 3.956 |
| **Brazil** | 0.058 | 0.002 | 0.066 | 0.088 | 0.000 | 0.001 | 0.007 | 0.222 |
| **OLAC** | 2.438 | 0.105 | 0.620 | 0.017 | 0.007 | 0.018 | 0.022 | 3.226 |
| **China** | 0.323 | 0.111 | 0.176 | 1.227 | 0.000 | 0.075 | 0.002 | 1.915 |
| **India** | 0.099 | 0.064 | 0.243 | 0.023 | 0.000 | 0.022 | 1.538 | 1.989 |
| **Pakistan** | 0.031 | 0.009 | 0.154 | 0.004 | 0.000 | 0.002 | 0.791 | 0.991 |
| **Indonesia** | 0.011 | 0.001 | 0.079 | 0.036 | 0.000 | 0.010 | 0.246 | 0.384 |
| **OMI\_Asia** | 0.553 | 0.095 | 0.276 | 0.290 | 0.001 | 0.126 | 0.381 | 1.721 |
| **Bangladesh** | 0.017 | 0.003 | 0.085 | 0.007 | 0.000 | 0.001 | 0.382 | 0.495 |
| **OLI\_Asia** | 0.161 | 0.019 | 0.062 | 0.318 | 0.001 | 0.028 | 0.108 | 0.698 |
| **CtrlAsia** | 0.012 | 0.000 | 0.022 | 0.001 | 1.711 | 0.000 | 0.190 | 1.937 |
| **MI\_MENA** | 0.106 | 0.030 | 0.767 | 0.002 | 0.002 | 0.040 | 1.848 | 2.796 |
| **Turkey** | 0.014 | 0.003 | 1.123 | 0.000 | 0.000 | 0.009 | 0.060 | 1.210 |
| **OFSU\_OEE** | 0.199 | 0.021 | 1.348 | 0.000 | 2.038 | 0.031 | 0.113 | 3.750 |
| **OMI\_SSA** | 0.031 | 0.006 | 0.250 | 0.001 | 0.001 | 0.008 | 0.006 | 0.303 |
| **LI\_SSA** | 0.062 | 0.017 | 0.330 | 0.001 | 0.001 | 0.010 | 0.247 | 0.667 |
| **SthAfrica** | 0.005 | 0.003 | 0.043 | 0.000 | 0.000 | 0.013 | 0.000 | 0.065 |
| **Total** | 109.792 | 12.353 | 150.064 | 62.741 | 15.865 | 24.142 | 44.538 | 419.494 |
| **Migrants All** | 9.930 | 1.157 | 12.078 | 2.282 | 3.969 | 1.703 | 6.799 | 37.918 |
| **LMI Origin** | 8.047 | 0.500 | 5.653 | 2.017 | 3.770 | 0.394 | 5.941 | 26.322 |
| **Mig Shares All Migrants** | 5.8 | 5.9 | 5.1 | 2.4 | 6.1 | 7.5 | 21.1 | 5.9 |
| **LMI Origin** | 4.7 | 2.5 | 2.4 | 2.1 | 5.8 | 1.7 | 18.5 | 4.1 |

**Table 4: Annual average wage earnings per unskilled worker by origin and HI host region – BaU 2007**

*$US 1000 per worker per year. Last column: Average annual wage earnings of non-migrants in the origin region.*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **USA** | **Canada** | **EEA** | **HI\_Asia** | **Oceania** | **HI\_MENA** | **Russia** | ***Native*** |
| **Native** | 53.3 | 41.7 | 32.4 | 27.5 | 25.6 | 15.9 | 6.1 |  |
| **USA** |  | 50.9 | 51.4 | 48.7 | 47.7 | 47.0 |  | *53.3* |
| **Canada** | 50.4 |  | 43.6 | 39.1 | 39.4 | 37.6 |  | *41.7* |
| **EEA** | 47.8 | 40.6 | 38.8 | 35.9 | 39.9 | 32.7 | 9.4 | *32.4* |
| **HI\_Asia** | 45.6 | 37.3 | 40.7 | 29.5 | 32.3 | 24.4 |  | *27.5* |
| **Russia** | 41.5 | 32.8 | 16.4 | 25.9 | 29.7 | 30.0 |  | *6.1* |
| **Oceania** | 42.9 | 34.6 | 42.2 | 35.4 | 28.8 | 36.1 |  | *25.6* |
| **HI\_MENA** | 48.4 | 37.6 | 39.4 | 31.5 | 33.6 | 11.3 |  | *15.9* |
| **Mexico** | 41.3 | 32.6 | 28.4 | 25.5 | 27.6 | 19.8 | 5.5 | *5.3* |
| **Brazil** | 41.5 | 32.8 | 26.0 | 26.9 | 29.1 | 29.7 |  | *6.1* |
| **OLAC** | 41.0 | 32.4 | 29.8 | 26.3 | 29.9 | 29.7 | 5.4 | *4.3* |
| **China** | 40.4 | 31.7 | 29.7 | 20.9 | 24.5 | 12.2 | 5.0 | *1.7* |
| **India** | 40.2 | 31.5 | 34.2 | 23.6 | 25.6 | 9.9 |  | *1.1* |
| **Pakistan** | 40.2 | 31.5 | 34.9 | 22.4 | 26.9 | 10.4 |  | *1.0* |
| **Indonesia** | 40.3 | 31.6 | 32.5 | 22.7 | 27.3 | 9.4 |  | *1.3* |
| **OMI\_Asia** | 40.2 | 31.5 | 32.0 | 24.7 | 26.5 | 9.1 | 4.9 | *1.5* |
| **Bangladesh** | 40.0 | 31.4 | 34.3 | 22.0 | 24.7 | 8.8 |  | *0.4* |
| **OLI\_Asia** | 40.0 | 31.4 | 30.4 | 16.6 | 27.8 | 10.6 | 4.8 | *0.4* |
| **CtrlAsia** | 40.2 | 31.9 | 14.4 | 23.2 | 25.8 | 28.7 | 5.4 | *1.8* |
| **MI\_MENA** | 40.4 | 31.8 | 30.4 | 24.9 | 29.1 | 12.4 | 5.1 | *2.2* |
| **Turkey** | 42.2 | 33.6 | 32.6 | 27.1 | 31.6 | 16.4 | 8.6 | *9.2* |
| **OFSU\_OEE** | 41.3 | 32.4 | 20.3 | 20.9 | 30.2 | 28.6 | 5.2 | *2.8* |
| **OMI\_SSA** | 40.3 | 31.7 | 26.8 | 24.9 | 29.6 | 10.0 | 4.9 | *1.2* |
| **LI\_SSA** | 40.1 | 31.4 | 29.7 | 23.5 | 26.6 | 14.2 | 4.7 | *0.5* |
| **SthAfrica** | 41.3 | 32.7 | 34.5 | 25.2 | 27.7 | 19.9 |  | *5.6* |

**Table 5: Annual average wage earnings per skilled worker by origin and HI host region – BaU 2007**

*$US 1000 per worker per year. Last column: Average annual wage earnings of non-migrants in the origin region.*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **USA** | **Canada** | **EEA** | **HI\_Asia** | **Oceania** | **HI\_MENA** | **Russia** | ***Native*** |
| **Native** | 76.3 | 42.6 | 41.3 | 33.0 | 42.0 | 21.5 | 6.3 |  |
| **USA** |  | 69.5 | 71.2 | 67.5 | 67.9 | 68.3 |  | *76.3* |
| **Canada** | 67.8 |  | 47.5 | 40.1 | 45.5 | 41.5 |  | *42.6* |
| **EEA** | 67.5 | 44.3 | 48.5 | 44.0 | 47.2 | 37.0 | 10.3 | *41.3* |
| **HI\_Asia** | 64.6 | 39.1 | 44.6 | 33.3 | 41.5 | 34.9 |  | *33.0* |
| **Russia** | 58.8 | 33.5 | 25.8 | 27.4 | 35.0 | 32.3 |  | *6.3* |
| **Oceania** | 63.7 | 41.7 | 48.1 | 42.0 | 38.6 | 45.2 |  | *42.0* |
| **HI\_MENA** | 65.9 | 38.6 | 43.3 | 33.4 | 41.5 | 22.4 |  | *21.5* |
| **Mexico** | 60.2 | 35.0 | 38.1 | 27.8 | 36.6 | 31.0 | 10.9 | *12.0* |
| **Brazil** | 60.4 | 35.2 | 38.4 | 29.8 | 37.8 | 33.8 |  | *12.8* |
| **OLAC** | 58.9 | 33.7 | 37.5 | 27.8 | 37.3 | 33.3 | 7.0 | *7.5* |
| **China** | 58.9 | 33.7 | 38.3 | 25.5 | 33.7 | 23.9 | 6.5 | *6.8* |
| **India** | 57.6 | 32.4 | 38.6 | 24.3 | 33.7 | 13.4 |  | *1.7* |
| **Pakistan** | 57.6 | 32.4 | 38.3 | 24.4 | 34.8 | 13.6 |  | *1.8* |
| **Indonesia** | 58.1 | 32.9 | 36.9 | 24.9 | 35.8 | 14.7 |  | *3.6* |
| **OMI\_Asia** | 57.8 | 32.5 | 37.0 | 25.4 | 32.8 | 14.2 | 5.3 | *3.2* |
| **Bangladesh** | 57.6 | 32.3 | 37.0 | 24.2 | 32.5 | 13.7 |  | *1.6* |
| **OLI\_Asia** | 57.5 | 32.3 | 36.5 | 22.0 | 35.2 | 19.9 | 5.1 | *0.9* |
| **CtrlAsia** | 57.5 | 33.2 | 22.0 | 26.3 | 32.5 | 31.3 | 6.2 | *2.7* |
| **MI\_MENA** | 58.3 | 33.2 | 38.0 | 26.4 | 35.5 | 18.2 | 5.8 | *4.3* |
| **Turkey** | 60.8 | 35.5 | 40.4 | 27.7 | 39.4 | 20.1 | 0.0 | *14.3* |
| **OFSU\_OEE** | 58.2 | 33.8 | 25.8 | 25.4 | 37.1 | 31.3 | 5.6 | *3.6* |
| **OMI\_SSA** | 58.0 | 32.9 | 38.0 | 26.8 | 36.5 | 15.8 | 6.2 | *2.2* |
| **LI\_SSA** | 57.5 | 32.4 | 37.9 | 25.5 | 33.7 | 16.1 | 5.1 | *1.1* |
| **SthAfrica** | 59.9 | 34.6 | 40.5 | 27.2 | 35.1 | 29.7 |  | *10.7* |

**Table 6: South-South Migrant Worker Stocks – BaU 2007**

*Migrant Workers (Skilled and Unskilled) in 1000s. Shares in percent*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **No of Migrant Workers** (*1000s)* | | | **LMI Share in** | | **LMI Migrant Share** |
|  | **To LMIs** | **From LMIs** | **Net LMI** | **Emigration** | **Immigration** | **In Host Workforce** |
| **Mexico** | 33.3 | 36.8 | 3.4 | 0.8 | 14.8 | 0.1 |
| **Brazil** | 107.9 | 87.6 | -20.2 | 23.0 | 26.4 | 0.1 |
| **OLAC** | 1614.0 | 1620.9 | 6.9 | 25.0 | 69.9 | 1.3 |
| **China** | 552.6 | 76.8 | -475.8 | 16.0 | 69.2 | 0.0 |
| **India** | 1989.3 | 2590.3 | 601.1 | 48.2 | 98.3 | 0.6 |
| **Pakistan** | 498.0 | 1098.2 | 600.2 | 36.0 | 99.8 | 2.0 |
| **Indonesia** | 481.7 | 63.3 | -418.4 | 53.4 | 79.9 | 0.1 |
| **OMI\_Asia** | 444.4 | 1287.4 | 842.9 | 13.7 | 88.3 | 0.9 |
| **Bangladesh** | 1722.7 | 398.0 | -1324.7 | 79.2 | 99.9 | 0.6 |
| **OLI\_Asia** | 872.1 | 667.9 | -204.2 | 47.7 | 96.8 | 0.9 |
| **CtrlAsia** | 965.6 | 962.0 | -3.7 | 25.1 | 35.4 | 3.2 |
| **MI\_MENA** | 723.7 | 997.7 | 273.9 | 20.7 | 67.6 | 1.0 |
| **Turkey** | 10.7 | 61.6 | 50.9 | 0.8 | 10.3 | 0.3 |
| **OFSU\_OEE** | 1152.7 | 1089.5 | -63.2 | 18.2 | 25.8 | 2.6 |
| **OMI\_SSA** | 1023.9 | 2030.2 | 1006.3 | 67.6 | 91.5 | 1.8 |
| **LI\_SSA** | 3395.7 | 2284.2 | -1111.5 | 79.7 | 94.9 | 1.3 |
| **SthAfrica** | 106.4 | 342.4 | 235.9 | 38.5 | 73.4 | 1.9 |
| **Total 2007** | 15694.8 | 15694.8 | 0.0 | 31.7 | 66.8 |  |
| **Total 2030** | 23528.1 | 23528.1 | 0.0 | 39.1 | 72.4 |  |

**Figure 1: Remittances to LMI Households by HI Host Region – BaU 2007 and 2030**

*US$ billion*

Figure 1 displays baseline annual remittances sent by South-North migrants back to their region of origin in 2007 and 2030 by HI host region, while the black bars in Figure 3 show the corresponding flows by receiving LMI region in the benchmark year. The largest remittance flows to LMIs are sent from the USA, followed with a large distance by flows from the EEA. This distance is projected to increase further by 2030, as remittances from migrants to the USA are projected to grow far stronger (+85.9 percent) over the simulation period than those by migrants located in the EEA (+59.9). The main reason for this remittance growth differential is that the US labor force is projected to grow (by 8.4 percent) while the EEA workforce shrinks (by –5.5 percent) over the simulation period. Correspondingly, the absolute size of LMI migrant stocks expands in the US and shrinks in the EEA along the baseline path. Similarly, projected growth of remittance flows to LMI households sent from HI\_MENA is projected to be very high (+192 percent) as the baseline labor force growth projection (+72 percent) is high.

**Figure 2: Remittances to LMI Households by LMI Host Region – BaU 2007 and 2030**

*US$ billion*

Among remittances sent home by South-South migrants, the largest baseline flows originate from OMI\_Asia, OLAC and India, and a particularly high growth rate is projected for remittances sent home by workers of LI\_SSA origin employed in OMI\_SSA (Figure 2).

The baseline share of remittances sent from LMI host regions in total remittances received by LMI regions is generally small (Figure 3), but not negligibly small in origin regions such as LI\_SSA, OMI\_SSA, Bangladesh and Indonesia which have a very high headcount share of emigrants to LMI destinations in total out-migration (Table 5).

**Figure 3: Remittances by Receiving LMI Region – BaU 2007**

*US$ Billion*

1. **International Migration Scenarios**
   1. **South-North Migration Scenario**
      1. **Scenario Specification**

The first scenario considers a gradual exogenous increase in labor migration from LMI to HI regions and is designed to provide a modified update of the South-North migration scenario presented in World Bank (2006), which used the GTAP 6 database and a precursor of the current GMig2 migration database. It is assumed that existing binding restrictions on LMI-HI migration to each of the six HI regions are relaxed such that the total labor force in each of the host regions rises eventually by 3 percent relative to the baseline.[[1]](#footnote-1) The migration increase is gradually phased in over the period 2010 to 2020, and beyond 2020 the LMI migrant stocks remain 3 percent above BaU level. The distribution of the additional LMI migrants by region of origin in each host region is assumed to be pro rata of the corresponding BaU distribution. Table 7 shows the resulting deviations in migrant worker stocks in 2030 from their 2030 baseline levels.

Thus, under this scenario an additional 19.2 million workers of LMI origin work in HICs by 2030.

To avoid any potential misunderstanding it should be emphasized that the figures in Table 7 do *not* show assumed net inflows for the year 2030. The net inflows required to reach the migrant stock deviations from the 2030 baseline levels have by assumption largely taken place gradually over the period up to 2020.

**Table 7: Increase in LMI-HI Migrant Worker Stocks by 2030 over BaU 2030 Levels**

*Million Workers (Skilled and Unskilled)*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **USA** | **Canada** | **EEA** | **HI\_Asia** | **Russia** | **Oceania** | **HI\_MENA** | **Total HI** |
| **Mexico** | 1.868 | 0.011 | 0.019 | 0.002 | 0.004 | 0.000 | 0.000 | 1.905 |
| **Brazil** | 0.050 | 0.003 | 0.110 | 0.119 | 0.000 | 0.002 | 0.002 | 0.287 |
| **OLAC** | 1.571 | 0.128 | 0.885 | 0.028 | 0.004 | 0.033 | 0.006 | 2.654 |
| **China** | 0.267 | 0.115 | 0.281 | 1.591 | 0.000 | 0.131 | 0.000 | 2.387 |
| **India** | 0.190 | 0.071 | 0.372 | 0.059 | 0.000 | 0.044 | 0.241 | 0.978 |
| **Pakistan** | 0.035 | 0.013 | 0.188 | 0.010 | 0.000 | 0.004 | 0.124 | 0.373 |
| **Indonesia** | 0.018 | 0.002 | 0.124 | 0.053 | 0.000 | 0.022 | 0.039 | 0.257 |
| **OMI\_Asia** | 0.542 | 0.113 | 0.394 | 0.442 | 0.001 | 0.220 | 0.059 | 1.770 |
| **Bangladesh** | 0.018 | 0.004 | 0.103 | 0.015 | 0.000 | 0.004 | 0.060 | 0.204 |
| **OLI\_Asia** | 0.098 | 0.019 | 0.115 | 0.489 | 0.001 | 0.042 | 0.016 | 0.780 |
| **CtrlAsia** | 0.014 | 0.001 | 0.040 | 0.002 | 0.933 | 0.001 | 0.052 | 1.044 |
| **MI\_MENA** | 0.117 | 0.043 | 0.957 | 0.004 | 0.002 | 0.061 | 0.292 | 1.476 |
| **Turkey** | 0.013 | 0.003 | 1.025 | 0.001 | 0.000 | 0.012 | 0.009 | 1.064 |
| **OFSU\_OEE** | 0.182 | 0.025 | 1.536 | 0.001 | 0.996 | 0.046 | 0.026 | 2.811 |
| **OMI\_SSA** | 0.045 | 0.010 | 0.334 | 0.002 | 0.000 | 0.013 | 0.001 | 0.405 |
| **LI\_SSA** | 0.064 | 0.023 | 0.464 | 0.002 | 0.001 | 0.019 | 0.038 | 0.610 |
| **SthAfrica** | 0.011 | 0.006 | 0.104 | 0.001 | 0.000 | 0.032 | 0.000 | 0.154 |
| **Total** | 5.104 | 0.592 | 7.050 | 2.820 | 1.942 | 0.685 | 0.965 | 19.158 |
| **% Inc over BaU All** | 29.6 | 20.6 | 44.1 | 95.6 | 39.1 | 21.5 | 10.9 | 34.2 |
| **% Inc over BaU LMI** | 40.3 | 47.2 | 99.4 | 111.2 | 41.5 | 73.8 | 12.9 | 52.3 |
| **% Inc over BaU LF** | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |

* + 1. **Simulation Results**

As shown in Table 8, the assumed movement of labor towards locations with higher labor productivity raises global real GDP considerably over the simulation period and by 2030 annual aggregate real world income is around US$ 1.1 trillion higher than in the BaU scenario for this year. Not surprisingly, GDP rises relative to BaU in the host regions and drops in the regions of origin, whereby the strength of the effect on origin region GDP depends primarily on the share of the additional emigrants in the source region’s baseline labor force. Changes in GDP per capita of the total population show the reverse pattern, as GDP per worker initially drops in destination regions and rises in origin regions. The relaxation of the labor supply constraint to the production of tradable goods and services in the host regions and the corresponding tightening of this constraint in sending regions entails a noticeable terms of trade reduction for most of the HIC host regions and a corresponding terms of trade improvement in all sending LMI regions.

The macroeconomic impacts on the labor-sending regions are evidently largest for the regions in which the additional emigrant workers account for a significant fraction of the baseline labor, namely OFSU\_OEE, Turkey, Mexico, Other Latin America and Central Asia (which lose respectively 8.1, 3.5, 3.1, 1.6 and 2.6 percent of their labor force in headcount terms by 2030), and small for LMIs in which the size of the labor force is only marginally affected, such as Brazil, India, Indonesia, Bangladesh, OMI\_SSA and LI\_SSA, which are regions in which the labor force headcount only shrinks by 0. 2 percent relative to the 2030 baseline.

Figures 4 and 5 display the impacts on South-North migrant remittances by location of the sending and receiving households respectively. In absolute terms, the total of HIC-LMI remittances in 2030 is around US$ 150 billion higher than in BaU 2030. The reported changes reflect the net effect of remittances sent by the new migrants and changes in the remittance flows of incumbent LMI-HIC migrants who suffer a drop in labor income due to the adverse wage impacts of the migrant inflows and thus cut down their remittance transfers accordingly. Correspondingly, there will be winners and losers among the remittance recipients in the LMI origin regions despite the clearly positive aggregate net effects under this scenario.

**Table 8: Impact on Real GDP and the Terms of Trade – South-North Migration Scenario**

*Percentage* *changes relative to BaU; Change in World GDP (last row) in US$ billion (2007 prices);   
Change in World GDP per capita (last row) in US$ 1000 (2007 prices)*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Real GDP** | | | **Real GDP per capita** | | | **Terms of Trade** | | |
|  | **2020** | **2025** | **2030** | **2020** | **2025** | **2030** | **2020** | **2025** | **2030** |
| **USA** | 1.9 | 2.1 | 2.2 | -1.3 | -1.0 | -0.9 | -0.7 | -0.8 | -0.8 |
| **Canada** | 1.8 | 2.0 | 2.1 | -1.6 | -1.3 | -1.1 | 0.2 | 0.1 | 0.1 |
| **EEA** | 1.8 | 1.9 | 2.0 | -1.5 | -1.3 | -1.1 | -0.2 | -0.2 | -0.3 |
| **HI\_Asia** | 1.5 | 1.6 | 1.7 | -1.5 | -1.3 | -1.1 | -0.4 | -0.4 | -0.4 |
| **Russia** | 1.2 | 1.5 | 1.7 | -2.0 | -1.7 | -1.5 | 0.1 | 0.0 | -0.1 |
| **Oceania** | 2.0 | 2.2 | 2.4 | -1.2 | -0.9 | -0.8 | -0.2 | -0.4 | -0.5 |
| **HI\_MENA** | 1.0 | 1.3 | 1.5 | -2.2 | -1.9 | -1.8 | 0.3 | 0.1 | 0.0 |
| **Mexico** | -1.1 | -1.3 | -1.4 | 2.2 | 1.9 | 1.7 | 0.9 | 1.1 | 1.1 |
| **Brazil** | -0.2 | -0.2 | -0.2 | 0.1 | 0.1 | 0.1 | 0.3 | 0.2 | 0.0 |
| **OLAC** | -1.0 | -1.1 | -1.1 | 0.9 | 0.7 | 0.5 | 0.8 | 0.8 | 0.8 |
| **China** | -0.2 | -0.1 | -0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 |
| **India** | -0.1 | -0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.4 | 0.4 | 0.4 |
| **Pakistan** | -0.2 | -0.2 | -0.1 | 0.3 | 0.3 | 0.3 | 0.8 | 0.7 | 0.6 |
| **Indonesia** | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.3 | 0.2 | 0.2 |
| **OMI\_Asia** | -0.2 | -0.3 | -0.3 | 0.9 | 0.8 | 0.8 | 0.3 | 0.3 | 0.3 |
| **Bangladesh** | -0.1 | -0.1 | -0.1 | 0.1 | 0.1 | 0.1 | 0.9 | 0.8 | 0.7 |
| **OLI\_Asia** | -0.3 | -0.3 | -0.3 | 0.6 | 0.5 | 0.5 | 0.7 | 0.6 | 0.5 |
| **CtrlAsia** | -1.4 | -1.5 | -1.5 | 1.7 | 1.4 | 1.1 | 0.7 | 0.6 | 0.5 |
| **MI\_MENA** | -0.3 | -0.3 | -0.3 | 0.8 | 0.8 | 0.7 | 0.9 | 0.8 | 0.8 |
| **Turkey** | -1.6 | -1.8 | -2.0 | 2.4 | 2.0 | 1.6 | 0.5 | 0.4 | 0.4 |
| **OFSU\_OEE** | -4.4 | -4.8 | -5.1 | 3.7 | 3.5 | 3.3 | 1.2 | 1.4 | 1.5 |
| **OMI\_SSA** | 0.0 | 0.1 | 0.1 | 0.3 | 0.3 | 0.3 | 0.8 | 0.6 | 0.5 |
| **LI\_SSA** | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.5 | 0.4 | 0.3 |
| **SthAfrica** | -0.5 | -0.6 | -0.6 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 |
| **World** | 1.0 | 1.0 | 1.1 | 1.0 | 1.0 | 1.1 |  |  |  |
| **ΔWorld GDP** | 813.4 | 973.3 | 1129.3 | 0.106 | 0.121 | 0.135 |  |  |  |

**Figure 4: Change in HIC-LMI Remittances by Host Region 2030 – South-North Migration Scenario**

*Percentage* *changes relative to BaU*

**Figure 5: Change in HIC-LMI Remittances by Receiving Region 2030 –**

**South-North Migration Scenario**

*Percentage* *changes relative to BaU 2030*

Figures 6 and 7 show the simulated evolution of the real wages (nominal wages deflated by the region’s consumer price index CPI) for native skilled and unskilled workers in both host and origin regions over the period 2015 to 2030. The figures for unskilled wages in the HIC host regions display a dynamic pattern that deserves particular attention. The influx of additional unskilled LMI migrants initially lowers native host region wages relative to the baseline, yet after the completion of the gradual net increase in the workforce by 2020 native unskilled wages begin to recover and are by 2030 actually slightly higher than in the baseline in most HICs – e.g. in the USA (EEA) the wage drops by -0.5 percent (-1.0 percent) below base by 2015, but then rises by 0.3 percent (0.3 percent) above base towards 2030.

To explain this perhaps counter-intuitive positive longer-run wage response to an increase in the labor supply, we need to look at the evolution of the aggregate capital stocks and real returns to capital in the host regions in Figures 10 and 9. Since GDP in HICs rises relative to the baseline and the real return to capital increases as capital becomes relatively scarcer with the influx of labor, the aggregate household savings volume in all HICs rises and induces a process of additional capital accumulation. By 2030 the aggregate capital stock is over one percent higher than in BaU

2030. This capital accumulation effect pushes the marginal productivity of unskilled labor upwards and drives the recovery of host native wages.

From a methodological perspective, it is worth noting that comparative-static CGE approaches to similar international labor movement scenarios entirely miss this induced accumulation effect, and are thus bound to seriously underestimate the gains from migration for host nations.

Since demand for skilled labor in LINKAGE is effectively less elastic than demand for unskilled labor, the initial downward pressure on skilled wage rates in the host countries is more pronounced than that on unskilled labor. The capital accumulation effect reduces the deviation of the native skilled wage paths from the BaU paths over time, but in contrast to unskilled labor the deviation remains slightly negative up to 2030 in most HIC regions (Figure 7).

However, as the new LMI migrants are assumed to be perfect substitutes for incumbent migrants – i.e. the LMI migrants already present in the HIC regions in the BaU scenario - of the same origin and closer substitutes for migrants from other LMI regions than for native workers in the host region, the largest adverse real wage effects are experienced by the incumbent LMI migrants (Figure 8).[[2]](#footnote-2)

Remaining native workers in LMI origin regions where the labor supply drops significantly enjoy pronounced real wage increases (Figure 6 and 7) as the marginal productivity of remaining labor rise with the increase in capital-labor ratios. Correspondingly, real returns to capital drop (Figure 9). Together with the decline in aggregate GDP this effect entails a decline in aggregate saving and net investment volumes and aggregate capital stocks fall slightly below baseline levels in these regions – e.g. in Mexico and OLAC the capital stock is 0.6 percent below base by 2030 and in Central Asia and Turkey 1.0 percent below base by that year. However, in regions where the effect of emigration on the aggregate labor supply is small, opposite effects on savings volumes including the increase in remittance income and the positive impact of the rise in per-capita income on the average propensity to save dominate, and the capital stock rises slightly relative to BaU levels – e.g. in Pakistan, OMI\_SSA and LI\_SSA, capital stocks are by 2030 0.2 to 0.3 percent higher than in the baseline.

The assumption of an inelastic labor supply in the origin countries is evidently critical for the size orders of the origin country effects and results would differ if one assumes the presence of underemployment in the status quo ante.

From an intra-region distributional perspective as well as from a political economy perspective, it is noteworthy that in tendency the additional South-North migration favors capital income recipients and hits labor income recipients in the host regions at least in the short run, while in the origin nations capital owners are hurt while workers gain.

**Figure 6: Impact on Real Wages of Native Unskilled Workers – South-North Migration Scenario**

*Percentage* *changes relative to BaU*

**Figure 7: Impact on Real Wages of Native Skilled Workers – South-North Migration Scenario**

*Percentage* *changes relative to BaU*

**Figure 8: Impact on Wages of Incumbent LMI Migrants by Host Region 2030 -   
South-North Migration Scenario**

*Percentage* *changes relative to BaU 2030*

**Figure 9: Impact on Real Returns to Capital – South-North Migration Scenario**

*Percentage* *changes relative to BaU*

**Figure 10: Change in HIC Aggregate Real Capital Stocks - South-North Migration Scenario**

*Percentage* *changes relative to BaU*

Table 9 provides a decomposition analysis of the annual real income changes at the end of the simulation relative to the 2030 baseline real income for the various affected groups.

The decomposition assumes that new migrants earn only labor income and received no remittances in the baseline and that incumbent migrants receive a share of the host region’s non-labor income that equals their respective shares in labor income. New migrants’ real income change is the after-tax CPI-deflated labor income net of remittance transfers adjusted for purchasing power differentials between the host and the origin region minus CPI-deflated baseline net labor income. For the other groups the figures are the sum of changes in their CPI-deflated net factor income and remittances sent or received. Table 10 reports the evolution of the aggregate real income change for the different household groups over time.

It is noteworthy, that in absolute terms natives of the HIC host regions gain most and this gain is primarily due to the rise in returns to capital, while in terms of relative changes (lower panel of Table 10) the new migrants enjoy the largest welfare increases.[[3]](#footnote-3) Incumbent migrants in the HIC regions experience significant losses as they suffer large wage rate regions and own only small shares of the host region’s total capital stock and thus benefit little from the increase in capital returns. However, on a global scale and in most individual regions the gains of new migrants exceed the losses of old migrant by a large margin. Remaining natives in the region of origin enjoy a net increase in remissions as well as an increase in labor income as shown earlier while capital income drops. At a global scale, their net annual real income increases by 0.4 percent in this scenario.

By 2030 annual global aggregate welfare is US$ 745 billion (+0.8 percent) higher than in the baseline. LMI natives’ aggregate annual welfare gain amounts to US$ 213 billion (+0.6) percent,

while HIC natives’ 2030 real income rises by US $531 billion in this scenario.

Thus, a moderate relaxation of barriers to South-North labor migration as considered here generates substantial net gains for natives of low- and middle income countries. Interestingly, however, according to these simulation results the additional migration flows from LMI to HIC does in global aggregate terms not contribute to a convergence of real incomes between natives of LMI and HIC regions, as the latter gain more than the former in both absolute and relative terms (Table 10).

As the scenario considered here is essentially a time-shifted replication of the earlier simulation analysis in World Bank (2006) using more recent and improved data, a brief comparison of the global welfare results for 2025 – the endpoint of the simulation horizon in the earlier study – is in order (Table 11). The comparison reveals broad similarities in terms of the orders of magnitudes, but some noticeable differences in the details. Major reasons for deviations in the absolute global totals are that flows are measured in constant prices of different benchmark years (2001 in GEP versus 2007 in this study) and that the global baseline real income projections for 2025 in GEP appear to be considerably below the baseline projections used in this study.[[4]](#footnote-4)

A potential explanation for the slightly larger percentage increase in global welfare relative to the base (+0.82 versus +0.67 percent) is that in the GEP scenario 14.2 million additional workers have migrated by 2025, while in the present study migrant worker stocks are around 19 million higher than in the baseline. Part of the difference (around 3 million – see Table 7 for the 2030 figures) is due to the inclusion of Russia and the High-Income Middle East as host regions in the present study. The remainder of the difference must be due to upward revisions in the projections for baseline labor force growth in the HIC countries, given that in both studies the net increase in migrant labor stocks equals 3 percent of the baseline labor force headcount by 2025.

**Table 9: Welfare Impacts on Natives in Origin and Host Regions, New Migrants and Incumbent Migrants 2030 - South-North Migration Scenario**

*(Deviation of Real Income from BaU in US$ Billlion; New migrant income figures are PPP-adjusted)*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Incumbent Migrants** | | **Natives** | |
|  | **New Migrants** | **from LMIs** | **from HICs** | **Host Region** | **Origin Region** |
| **USA** | 99.710 | -44.254 | 4.288 | 159.417 |  |
| **Canada** | 4.653 | -3.089 | 1.856 | 20.168 |  |
| **EEA** | 50.854 | -33.498 | 10.252 | 217.316 |  |
| **HI\_Asia** | 9.267 | -10.014 | 0.330 | 60.699 |  |
| **Russia** | 7.092 | -2.533 | 0.160 | 21.040 |  |
| **Oceania** | 3.515 | -2.733 | 2.544 | 16.569 |  |
| **HI\_MENA** | 2.812 | 2.478 | 1.867 | 18.923 |  |
| **Mexico** |  | -0.007 | -0.299 |  | 9.078 |
| **Brazil** |  | -0.001 | -0.010 |  | 2.678 |
| **OLAC** |  | -0.243 | -0.334 |  | 17.500 |
| **China** |  | 0.000 | -0.002 |  | -4.738 |
| **India** |  | 0.005 | 0.014 |  | 31.547 |
| **Pakistan** |  | -0.005 | 0.001 |  | 4.968 |
| **Indonesia** |  | 0.002 | 0.004 |  | 5.576 |
| **OMI\_Asia** |  | -0.029 | 0.088 |  | 23.696 |
| **Bangladesh** |  | 0.003 | 0.001 |  | 5.059 |
| **OLI\_Asia** |  | 0.012 | 0.013 |  | 4.675 |
| **CtrlAsia** |  | -0.249 | -0.646 |  | -0.075 |
| **MI\_MENA** |  | -0.018 | -0.001 |  | 21.553 |
| **Turkey** |  | -0.031 | -0.704 |  | -8.193 |
| **OFSU\_OEE** |  | -0.339 | -2.345 |  | 0.204 |
| **OMI\_SSA** |  | 0.047 | 0.146 |  | 10.035 |
| **LI\_SSA** |  | 0.025 | 0.052 |  | 5.840 |
| **SthAfrica** |  | -0.029 | -0.041 |  | 1.009 |
| **Total** | **177.903** | **-94.501** | **17.235** | **514.132** | **130.413** |

**Table 10: Evolution of Aggregate Real Income Gains 2015-2030 - South-North Migration Scenario**

*Deviations from Baseline in US$ Billion*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** |  | **Incumbent Migrants** | | **Natives** | | **Total Change** | | |
|  | **New Migrants** | **from LMIs** | **from HICs** | **Host Region** | **Origin Region** | **LMI Natives** | **HIC Natives** | **Global** |
| **2015** | 82.863 | -40.597 | 6.660 | 142.801 | 57.329 | 99.594 | 149.461 | **249.055** |
| **2020** | 157.797 | -73.849 | 13.916 | 340.564 | 114.601 | 198.549 | 354.480 | **553.029** |
| **2025** | 169.379 | -85.986 | 15.111 | 431.491 | 124.363 | 207.756 | 446.602 | **654.358** |
| **2030** | 177.903 | -94.501 | 17.235 | 514.132 | 130.413 | 213.816 | 531.367 | **745.183** |

*Deviations from Baseline in Percent*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2015** | +204.3 | -2.7 | +0.4 | +0.4 | +0.3 | 0.53 | 0.40 | **+0.44** |
| **2020** | +163.5 | -4.2 | +0.8 | +0.8 | +0.5 | 0.79 | 0.83 | **+0.82** |
| **2025** | +141.8 | -4.3 | +0.7 | +0.8 | +0.4 | 0.65 | 0.95 | **+0.83** |
| **2030** | +125.1 | -4.2 | +0.7 | +1.0 | +0.4 | 0.55 | 1.03 | **+0.82** |

**Table 11: Comparison of Aggregate Welfare Changes for 2025 with World Bank GEP (2006)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Real Income Change in US$ Billion** | | | **Percentage Change** | |
|  | **This Study** | **GEP (2006)** | **GEP Rescaled\*** | **This Study** | **GEP (2006)** |
| **New Migrants** | 169 | 126 | 236 | +141.8 | +198.0 |
| **Incumbent Migrants from LMIs** | -94 | -88 | -206 | -4.3 | -9.4 |
| **Natives in LMI Origin Regions** | 124 | 131 | 279 | +0.4 | +0.9 |
| **HIC Natives** | 446 | 139 | 215 | +0.8 | +0.4 |
| **Global** | **654** | **308** | **534 Sum: 524** | **+0.82** | **+0.67** |

\*In this column the GEP figures are rescaled by applying the GEP percentage changes to a common base. E.g., GEP projected global real baseline income 2030 is 308/0.0067 = 45,970 while in this study it is 654/0.0082 = 79,756. 79,756\*0.0067 = 534. Row-specific were applied in this manner – so the sum of scaled figures does not exactly match the scaled total.s by 2025

* 1. **South-South Migration Reversal Scenario**

In order to obtain a broad indication of the order of magnitude of aggregate welfare impacts associated with current levels of South-South migration, we consider a – deliberately extreme - hypothetical reverse migration scenario, in which all bilateral LMI-LMI migrant labor stocks drop gradually over the period 2016 to 2025 so that by 2025 these stocks are 90 percent lower than in the baseline and then remain 90 percent below baseline beyond 2025. Leaving migrants return to the region of origin and take dependent household member with them. In line with the purpose of this scenario it is assumed that the productivity of return migrants is the same as that of existing native non-migrant workers in the new equilibrium.

Table 12 highlights the largest 2030 baseline South-South migration stocks and thus serves to identify the migration corridors along which the largest absolute international movements of labor are assumed to occur. In this scenario, South-South migrant stocks have dropped by 2030 by 21.2 million workers vis-à-vis the BaU scenario. In particular, cross-national intra-SSA migrant worker stocks are some 8.3 million below BaU 2030, 2 million Bangladeshi workers have returned from India, in turn 1.5 million Indian workers have returned from Pakistan, and 1.9 million international intra-Latin-American migrant workers have moved back home by 2030 compared to BaU 2030.

Global real GDP in 2030 is 53.5 billion US$ lower than in the baseline under this scenario and LMI GDP drops by a moderate 0.12 percent (Table 13). In some countries with a net increase in the total labor force (Bangladesh, Indonesia, China) GDP rises, but GDP per capita drops due to the net increase in the resident population. In other regions – notably in LI\_SSA, OLI\_Asia and OFSU\_OEE - aggregate GDP drops despite a net increase of the labor force, as on balance foreign migrants with relatively high productivity are replaced by native return migrants with lower productivity. In contrast, in India, MI\_MENA, Turkey and South Africa, the total labor force and the total population decline while the change in the composition of the labor force raises average productivity, so that GDP per capita rises slightly compared to the baseline.

Table 14 shows the PPP-adjusted changes in real income for return migrants, native non-migrant workers in the home region and remaining LMI-LMI migrants by region of origin. Native non-migrants in the home region are generally worse off, and this is primarily due to the loss of remittance income. The equilibrium impact on real wages for this group is a priori ambiguous, as the inflow of return migrants exerts downward pressure on the real wage, while in regions with a net outflow of migrants the decrease in the total labor supply entails an upward pressure. Thus, in the case of LI\_SSA where the total labor supply rises significantly the unskilled native real wage in 2030 drops by 1.2 percent relative to the baseline, while in the case of OLI\_Asia the net reduction in the total labor supply entails a rise in the unskilled native real wage on the order of 0.8. The impact on non-labor factor income for this group is likewise ambiguous. In the case of China only, the net increase in real capital income for this group is strong enough to dominate the loss of remittance income.

The real income impact on the small group of remaining LMI\_LMI migrant workers is unambiguously positive as this group enjoys significant real wage increases in this scenario.

There is a wide variation in the impact on return migrants by origin. The cases of LI\_SSA on the one hand and India or China on the other are opposite extremes and may serve to illustrate the point. As noted earlier, LI\_SSA migrant workers in their main LMI destinations enjoy large positive net wage differentials in relation to non-migrants of the same origin in the baseline, so that even after the deduction of remittances sent home and adjustments for purchasing power differentials between host and origin region, they are significantly better off in the baseline scenario than in the return scenario. In contrast, workers of Chinese origin in their main LMI destinations (OMI\_Asia and OLI\_Asia) earn significantly lower baseline wages than Chinese non-migrant workers, and thus would be better off by working in China. Similarly, low-skilled Indian migrant workers in their prime LMI destinations Pakistan, Bangladesh and other low-income Asia earn less than native low-skilled workers in India, and this explains the large gain for Indian return migrants reported in Table 14.

Overall, total LMI welfare drops by 0.4 percent relative to the 2030 baseline, and this figure suggests indirectly that on balance current levels of international LMI-LMI labor migration make a positive and non-negligible contribution to economic performance in developing countries.

**Table 12: South-South Migrant Labor Stocks – BaU 2030**

*Millions of workers (Skilled and unskilled). Host regions with less than 100,000 migrant workers and individual stocks less than 10,000 migrant stocks are excluded. Totals include small stocks not displayed here. Displayed entries account for 98.4 percent of total LMI-to-LMI migrant worker stocks.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **LMI Host Region** | | | | | | | | | | | | |  |
| **Origin Region** | **Brazil** | **OLAC** | **India** | **Pakistan** | **OMI\_Asia** | **Bangladesh** | **OLI\_Asia** | **CtrlAsia** | **MI\_MENA** | **OFSU\_OEE** | **OMI\_SSA** | **LI\_SSA** | **SthAfrica** | **Total to LMI** |
| ***Native*** | *114.6* | *158.2* | *636.1* | *86.4* | *168.2* | *95.4* | *105.4* | *37.0* | *142.3* | *31.1* | *213.6* | *363.1* | *21.4* | *3212.8* |
| **Brazil** |  | 0.12 |  |  |  |  |  |  |  |  | 0.01 |  |  | 0.14 |
| **OLAC** | 0.08 | 1.93 |  |  | 0.01 |  |  |  |  | 0.01 | 0.07 | 0.01 | 0.01 | 2.15 |
| **China** | 0.01 | 0.03 |  |  | 0.33 |  | 0.24 | 0.01 | 0.01 |  | 0.04 | 0.01 |  | 0.74 |
| **India** |  |  |  | 1.68 | 0.25 | 0.55 | 0.38 |  | 0.04 |  | 0.04 | 0.04 | 0.01 | 3.00 |
| **Pakistan** |  |  | 0.61 |  | 0.01 | 0.01 | 0.02 |  | 0.02 |  |  | 0.01 |  | 0.68 |
| **Indonesia** |  |  |  |  | 0.57 |  | 0.01 |  | 0.02 |  |  |  |  | 0.61 |
| **OMI\_Asia** |  |  | 0.12 | 0.01 | 0.17 |  | 0.24 |  | 0.03 |  |  |  |  | 0.60 |
| **Bangladesh** |  |  | 2.22 | 0.03 | 0.05 |  | 0.03 |  | 0.01 |  |  |  |  | 2.35 |
| **OLI\_Asia** |  | 0.01 | 0.53 | 0.04 | 0.20 |  | 0.03 |  | 0.31 |  |  |  |  | 1.18 |
| **CtrlAsia** |  |  |  |  | 0.01 |  |  | 0.59 | 0.07 | 0.38 |  |  |  | 1.06 |
| **MI\_MENA** | 0.01 | 0.02 | 0.01 |  | 0.01 |  |  | 0.01 | 0.88 | 0.01 | 0.06 | 0.04 |  | 1.07 |
| **OFSU\_OEE** |  | 0.01 |  |  |  |  |  | 0.67 | 0.02 | 0.49 |  |  |  | 1.24 |
| **OMI\_SSA** |  |  | 0.01 |  |  |  |  |  |  |  | 0.48 | 1.31 | 0.13 | 1.94 |
| **LI\_SSA** |  |  | 0.02 |  |  |  |  |  | 0.03 |  | 3.16 | 3.03 | 0.26 | 6.49 |
| **SthAfrica** |  |  |  |  |  |  |  |  |  |  | 0.04 | 0.16 |  | 0.21 |
| **Total from LMI** | 0.10 | 2.16 | 3.53 | 1.76 | 1.61 | 0.56 | 0.95 | 1.28 | 1.46 | 0.91 | 3.89 | 4.61 | 0.41 | 23.5 |

Note: Red entries: Stocks > 1 million workers ; Orange: 500 to 1 million workers; Yellow: 100 tsd to 500 tsd workers.

**Table 13: Impact on Real GDP and Population Size – South-South Migration Reversal Scenario**

*Percentage* *changes relative to BaU; Change in World GDP (last row) in US$ billion (2007 prices);   
Change in LMI GDP per capita (last row) in US$ (2007 prices)*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Real GDP** | | | **Real GDP per capita** | | | **Population** | | |
|  | **2020** | **2025** | **2030** | **2020** | **2025** | **2030** | **2020** | **2025** | **2030** |
| **Mexico** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Brazil** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **OLAC** | -0.1 | -0.2 | -0.3 | -0.1 | -0.3 | -0.3 | 0.0 | 0.0 | 0.0 |
| **China** | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 |
| **India** | 0.0 | 0.0 | -0.1 | 0.0 | 0.1 | 0.1 | -0.1 | -0.1 | -0.1 |
| **Pakistan** | -0.3 | -0.7 | -0.8 | 0.0 | 0.0 | -0.1 | -0.3 | -0.7 | -0.7 |
| **Indonesia** | 0.1 | 0.1 | 0.1 | -0.1 | -0.2 | -0.2 | 0.2 | 0.3 | 0.3 |
| **OMI\_Asia** | -0.3 | -0.7 | -0.8 | 0.0 | -0.2 | -0.3 | -0.3 | -0.5 | -0.5 |
| **Bangladesh** | 0.2 | 0.5 | 0.5 | -0.7 | -1.5 | -1.4 | 1.0 | 2.0 | 2.0 |
| **OLI\_Asia** | -0.3 | -0.8 | -1.0 | -0.5 | -1.3 | -1.4 | 0.2 | 0.5 | 0.5 |
| **CtrlAsia** | -0.6 | -1.6 | -1.9 | -0.5 | -1.3 | -1.6 | -0.1 | -0.2 | -0.3 |
| **MI\_MENA** | 0.0 | -0.1 | -0.1 | 0.1 | 0.1 | 0.1 | -0.1 | -0.2 | -0.2 |
| **Turkey** | 0.0 | -0.1 | -0.1 | 0.0 | 0.1 | 0.1 | -0.1 | -0.1 | -0.1 |
| **OFSU\_OEE** | 0.0 | 0.0 | 0.0 | -0.2 | -0.5 | -0.6 | 0.2 | 0.5 | 0.6 |
| **OMI\_SSA** | -0.3 | -0.7 | -0.8 | 0.1 | 0.0 | -0.1 | -0.3 | -0.7 | -0.7 |
| **LI\_SSA** | -0.1 | -0.4 | -0.5 | -0.4 | -0.9 | -1.0 | 0.2 | 0.5 | 0.5 |
| **SthAfrica** | -0.2 | -0.4 | -0.5 | 0.2 | 0.3 | 0.2 | -0.4 | -0.7 | -0.7 |
| **World** | -0.01 | -0.04 | -0.05 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **LMI** | -0.03 | -0.10 | -0.12 |  |  |  |  |  |  |
| **ΔWorld GDP** | -9.8 | -37.4 | -53.5 | -0.001 | -0.005 | -0.006 |  |  |  |

**Table 11: Welfare Impacts on Natives in Origin and Host Regions, New Migrants and Incumbent Migrants**

*US$Billion*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **PPP-Adjusted Real Income Change** | | | |
|  | **Return Migrants** | **Non-Migrants in Origin** | **Remaining Migrants** | **Total** |
| **Mexico** | -0.007 | -0.569 | 0.021 | -0.556 |
| **Brazil** | 0.099 | -1.152 | 0.073 | -0.980 |
| **OLAC** | 2.176 | -26.054 | 0.937 | -22.941 |
| **China** | 4.772 | 2.757 | 0.201 | 7.729 |
| **India** | 6.562 | -8.620 | 0.019 | -2.039 |
| **Pakistan** | 0.147 | -3.502 | 0.050 | -3.304 |
| **Indonesia** | 0.070 | -10.525 | 0.104 | -10.351 |
| **OMI\_Asia** | -0.086 | -9.642 | 0.123 | -9.605 |
| **Bangladesh** | 2.128 | -10.656 | 0.042 | -8.487 |
| **OLI\_Asia** | -0.855 | -6.010 | 0.106 | -6.759 |
| **CtrlAsia** | -0.533 | -12.087 | 0.342 | -12.277 |
| **MI\_MENA** | 2.285 | -7.979 | 0.111 | -5.583 |
| **Turkey** | -0.032 | -0.557 | 0.011 | -0.578 |
| **OFSU\_OEE** | -2.445 | -11.809 | 0.512 | -13.742 |
| **OMI\_SSA** | 0.629 | -9.736 | 0.249 | -8.858 |
| **LI\_SSA** | -3.985 | -23.127 | 0.657 | -26.455 |
| **SthAfrica** | 0.348 | -2.652 | 0.084 | -2.220 |
| **Total LMI** | 11.273 | -141.920 | 3.642 | -127.005 |

1. **Conclusions**

To sum up, two international labor migration scenarios involving the movement of worker from low- and middle income countries are presented in this study.

The first scenario assumes that existing binding restrictions on LMI-HI migration to each of the HI regions are relaxed such that the total labor force in each of the HI host regions rises eventually by 3 percent relative to the baseline. In this scenario an additional 19.2 million workers of LMI origin work in HICs by 2030. The movement of labor towards locations with higher labor productivity raises global real GDP considerably over the simulation period compared to a baseline scenario with fixed migrant worker shares in host regions’ total workforce, and by 2030 annual GDP is around US$ 1.1 trillion (+1.1 percent) higher than in the baseline.

By 2030 annual global aggregate welfare is US$ 745 billion (+0.8 percent) higher than in the baseline. LMI natives’ aggregate annual welfare gain amounts to US$ 213 billion (+0.6) percent,

while HIC natives’ 2030 real income rises by US $531 billion in this scenario.

Thus, a moderate relaxation of barriers to South-North labor migration as considered here generates substantial net gains for natives of low- and middle income countries. Interestingly, however, according to these simulation results the additional migration flows from LMI to HIC do in global aggregate terms not contribute to a convergence of real incomes between natives of LMI and HIC regions, as the latter gain more than the former in both absolute and relative terms.

The second is a hypothetical extreme reverse South-South migration scenario, in which eventually 90 percent of all baseline LMI-LMI migrants return to their origin country. Global real GDP in 2030 is 53.5 billion US$ lower than in the baseline under this scenario and LMI GDP drops by a moderate 0.12 percent Overall, total LMI welfare drops by 0.4 percent relative to the 2030 baseline, and this figure suggests indirectly that on balance current levels of international LMI-LMI labor migration make a positive and non-negligible contribution to economic performance in developing countries.

A limitation of the simulation analysis is that it does not incorporate some of the origin country impact channels identified in the migration literature. These channels include in particular potential productivity impacts associated with return migration and potential brain gain effects arising from incentives to invest in human capital formation in the presence of expected future migration opportunities. As Kerr and Kerr (2011) emphasize, proper accounting for return migration is essential for determining the economic impacts for both origin and host countries, given the available evidence on the extent of return migration from the main host regions and existing empirical estimates of possible associated benefits for the home country (e.g. Mayr and Peri, 2008; Dustmann and Weiss, 2007, De Vreyer, Gubert and Robilliard, 2010). With respect to brain gain effects, recent econometric evidence seems to point to a “robust, positive and sizeable effect of skilled migration prospects on human capital formation in developing countries” (Beine, Docquier and Rapoport, 2010; see Docquier and Rapoport, 2012 for qualifications). Correspondingly, there is scope for future extensions of the work presented here.

**References**

Bakewell, O. (2009) South-South Migration and Human Development: Reflections on African Experiences. *Human Development Research Paper* No.2009/07.

Basu, B. with J.T. Bang (2015) *International Remittance Payments and the Global Economy*. Routledge: New York.

Beine, M., F. Docquier and H. Rapoport (2010) On the Robustness of Brain Gain Estimates.  
*Annals of Economics and Statistics* 97/98, 143-65.

Borgy, V., X. Chojnicki, G. Le Garrec and C. Schwellnus (2010) Macroeconomic Consequences of Global Endogenous Migration: A General Equilibrium Analysis. *Annals of Economics and Statistics* 97/98, 13-39.

Clemens, M.A (2011) Economics and Emigration: Trillion-Dollar Bills on the Sidewalk? *Journal of Economic Perspectives* 25(3), 83-106.

Collier, P. (2013) *Exodus: Immigration and Multiculturalism in the 21st Century*. Penguin: London.

Docquier, F. and H. Rapoport (2012) Globalization, Brain Drain and Development. *Journal of Economic Literature* 50(3), 681-730.

De Vreyer, P., F. Gubert and A. Robilliard (2010) Are There Returns to Migration Experience? An Empirical Analysis using Data on Return Migrants and Non-Migrants in West Africa. *Annals of Economics and Statistics* 97/98, 307-28.

Dumont, J.-C., G. Spielvogel and S. Widmaier (2010), International Migrants in Developed, Emerging and Developing Countries: An Extended Profile. *OECD Social, Employment and Migration Working Paper* No.114.

Dustmann, C. and Y. Weiss (2007) Return Migration: Theory and Evidence. *CReAM Discussion Paper* No.02/07.

Kerr, S.P. and W.R. Kerr (2011) Economic Impacts of Immigration: A Survey. *NBER Working Paper* No.16736.

Mayr, K. and G. Peri (2008) Return Migration as Channel of Brain Gain. *CReAM Discussion Paper* No.04/08.

McKenzie, D. and D. Yang (2014) Evidence on Policies to Increase the Development Impacts of International Migration. *KNOMAD Working Paper* No.2

Narayanan, B., A. Aguiar and R. McDougall (Eds) (2012). Global Trade, Assistance, and Production: The GTAP 8 Data Base. Center for Global Trade Analysis, Purdue University: West Lafayette.

Pritchett, L. (2006) Let Their People Come: Breaking the Gridlock on International Labor Mobility. Center for Global Development.

Ratha, D. and W. Shaw (2007) South-South Migration and Remittances. *World Bank Working Paper* No.102.

Timmer, H. and D. van der Mensbrugghe (2006) International Migration, Purchasing Power Parity (PPP) and the Money Metric of Welfare Gains. *9th Annual Conference on Global Economic Analysis*, Addis Ababa.

UNESA (2012) *Population Facts* No.2012/3.

van der Mensbrugghe, D. (2011) *LINKAGE Technical Reference Document Version 7.1*.   
Washington, DC: TheWorld Bank – DECPG.

van der Mensbrugghe, D. and D. Roland-Holst (2009) Global Economic Prospects for Increasing Developing Country Migration into Developed Countries. *Human Development Reports Research Paper* 2009/50.

Walmsley, T.L., A. Aguiar, Z. Hussein and C. R. Parsons (2013) The GMig2 Data Base: Extending the GTAP8 to Include Global Bilateral Migration, Wages and Remittances. *GTAP Resource* No.4044.

Walmsley, T.L., L.A. Winters and S.A. Ahmed (2007) Measuring the Impact of the Movement of Labor Using a Model of Bilateral Migration Flows. *GTAP Technical Paper* No.28.

Walmsley, T.L. and L.A. Winters (2005) Relaxing the Restrictions on the Temporary Movement of Natural Persons: A Simulation Analysis. *Journal of Economic Integration* 20(4), 688-726.

World Bank (2006) *Global Economic Prospects 2006: Economic Implications of Remittances and Migration*. Washington DC: The World Bank.

Yang, D. (2011) Migrant Remittances. *Journal of Economic Perspectives* 25(3), 129-52.

1. Walmsley and Winters (2005) and Walmsley, Winters and Ahmed (2007) consider similar international migration scenarios in a comparative-static CGE framework and employ the same 3 percent figure. [↑](#footnote-ref-1)
2. The size orders for the real wage effects are obviously sensitive to the values for the substitution elasticities σl and σlz between workers by origin in equations (1) and (3) above. The simulation results presented here assume σl = 4 and σlz = 5. [↑](#footnote-ref-2)
3. Without the aforementioned PPP adjustment the total annual gain for new migrants in 2030 would be on the order of US$ 450 billion, but this figure would grossly overstate their real consumption increase compared to their baseline consumption levels. Conceptually, the PPP adjustment basically follows the logic of the standard equivalent variation measure of welfare changes, i.e. the PPP-adjusted real income changes for new migrants reported in Table 9 are a measure of the additional income new migrants would have required in the baseline situation in their region of origin to afford a real consumption level comparable to that enjoyed in the new equilibrium. See Mensbrugghe and Roland-Holst (2009) and Timmer and van der Mensbrugghe (2006) for further discussion. Alternatively, a PPP-adjusted measure of welfare change that would follow the logic of the compensation variation would be the hypothetical amount that could be deducted from new migrants’ income in the new equilibrium without making them worse off than they were in the baseline. The former method (used here) deflates new migrants’ net income after remissions in the post-migration equilibrium by the purchasing power differential between host and origin region and compare that figure with their baseline income, while the latter method would inflate the new migrants baseline income by the reciprocal of the PPP differential and compare that figure with net income after remittance payments in the new equilibrium. [↑](#footnote-ref-3)
4. See note below Table 11. This is somewhat surprising as the projections used here take account of the global economic crisis growth dips while the GEP 2006 uses pre-crisis projections. [↑](#footnote-ref-4)