

Measuring the Gains from the Nexus of International Migration and Remittances in Asia: A General Equilibrium Analysis¹

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Abstract

This study evaluates the potential gains from the nexus of international migration and remittances in Asia, using a global static CGE model. To clarify mechanism, channels and impact of immigration on wages, this study explores “wage elasticity” in a four-stage nested structure. Based on recent trends and patterns in cross-border labor mobility, it considers three scenarios with exogenous changes in bilateral migration stock. The simulation results found that migration to North America in south-north pattern would generate the largest gains to Asia. Migration to Middle East and Northern Africa in south-south pattern would have marginal effects, with South Asia being only the clear beneficiary. Intra-Asia migration would increase the region’s GDP by 0.6 percent, generating heterogeneous impact among countries, reflecting initial migration stock and the structure of labor market both in host and home countries. The impact on wages is mostly positive. Aggregate household income in Asia would increase by \$35 billion. However, drivers of household income gains differ between natives and migrants. For native households, an increase in wages outpaces the decline in labor supply. The opposite is the case for migrant households. The increase in the supply of migrant workers surpasses the decline or marginal changes in wages. Native households account for large share in additional income in most countries in the region, whereas migrant households enjoy fast growth of income gains.

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² The views expressed in this paper are those of the author and do not necessarily reflect views of the Inter-American Development Bank and its member countries. The usual caveat applies. contact: masakazuw@iadb.org

1. Introduction

With \$17 billion of GDP, accounting for 27 percent of the world, Asia is home for 3.8 billion people—55 percent of the global total. From the ancient times, the region has engaged in strong economic, social and cultural ties inside and with outside the region. Through historic backgrounds and linkages, countries in Asia, particularly East and South East Asia, have a long history of internal migration, which has shaped the very nature of the societies in the region.

In the past three decades, Asia has witnessed the surge in international migration. According to the World Bank (2011), today Asia is home for 55.7 million international migrants. Although international migration to North America and Middle East has been rising fast in these periods, intra-regional migration is increasingly recognized to be an important and integral component of economic and social development processes in the region. Asia is the region with large differences and diversities in economic structures, demographic compositions and social settings. ESCAP (2008) reported that current migration in the region is characterized by a number of new aspects, arising from divergences in economic growths and demographic structures. These disparities, which have amplified “pull and push” factors shaping migration movements, have created strong incentives for people particularly the young to migrate for better life, livings and higher returns.

In recent years, the global community has increasingly recognized the importance of international migration on development. International migration has been accepted to be an integral part of economic, demographic and social development process, particularly for developing countries. Recent empirical studies suggest that cross-border labor mobility would induce a virtuous circle generating substantial gains for both origin and recipient countries (Lucas, 2005; Pritchett, 2006). Recipient countries would expand their productive capacity by increasing labor force, which in turn would increase gross income. In developed countries, immigration would reduce the pressure of labor force shortages limiting growth potential (Walmsley and Winters, 2005; Poot and Cochrane, 2005). At the same time, sending countries would also likely benefit from increased remittances, continuous transfer of knowledge, absorption of new technology, investments made by native migrants, and the creation of business networks from diaspora (Dustmann and Kirchkamp, 2001; Stark, Helmenstein, and Prskawetz, 1997; Yang, 2004; Adams and Page, 2003; Ellerman, 2003).

Although there have been a growing number of studies in recent years, data and methodological limitations still pose significant challenges in evaluating the potential impact of migration-related feedback effects in a comprehensive and integral way. However, there are several CGE applications, measuring gains from international migration: Walmsley and Winters (2005); Walmsley, Winters, and Ahmed (2007); World Bank (2006); and Guzman and Watanuki (2012). All of these studies found unanimously that international migration generates win-win outcomes for both origin and host countries.

Applying the same approach, this paper aims to explore complex linkages between international migration and development process focusing on economic, demographic and social dimensions in Asia. Based on the World Bank (2011), it constructed full databases on international migration and corresponding remittances on a bilateral basis for the base year 2007. As with other studies, this study assumes that bilateral remittances, which are fixed proportion of migrants' aggregate household income, are function of the stock of migrant labor. In assessing migration-related effects, it is extremely important to evaluate the impact of immigration on wages, particularly in countries facing large influx of immigrant workers. In this respect, this study explores functional form of "wage elasticity" of labor supply in a four-stage nested structure, following Borjas (2003), and Ottaviano and Peri (2005) in particular.

Based on the recent migration trends and patters in Asia, this study considers three scenarios with different destinations—North America; Middle East and Northern Africa; and Asia itself—and the last one serves main scenario for this study. In each scenario, the study considers exogenous changes in migration stock by three percents on a bilateral basis. The simulation results found that migration to North America in the south-north pattern would generate the largest gains to Asia, with 0.7 percent increase in regional GDP. In contrast, migration to Middle East/ Northern Africa in the south-sough formation would have marginal effects. Countries in South Asia would gain marginally, whereas other countries in Asia are either hardly affected or lose, albeit being small.

Migration within Asia would generate positive impacts on all countries in the region, in which small, migrant-dependent countries would benefit the most. Despite greater changes in migration stock, aggregate gains under this scenario would be smaller than in scenario 1, reflecting wage differences for migrant workers at host countries. As a result of decline in native workers due to emigration in an imperfect substitution among labor categories by countries of origin, wages of native workers would rise, not fall, whereas the impact on wages for migrant labor would be mixed, but mostly positive. An increase in wages outweighs the decline in labor force for native workers. The opposite is the clear case for migrant labor. The rise in the supply of migrant labor outpaces the decline or marginal changes in wages. In the aggregate, native households in Asia would generate additional \$35 billion of income (90 percent of the region's income gain), whereas income of migrant households particularly from low-income origins would increase the fastest.

The rest of the paper is structured as follows. Section 2 presents international migration and remittances in Asia. It overviews historic trends of international migration and evaluates bilateral stock in the most recent data, as well as recent trend of remittances. Section 3 provides the analytical framework and benchmark data. It briefly describes the overview of the CGE model, and modeling approach of migration and remittances, followed by labor substitutability and the concept of wage elasticity. In this section, the structures of labor force and remittances in households' income were examined to lay

grounds for subsequent simulations. Section 4 reports scenarios and simulation results. Section 6 summarizes main findings and conclusions.

2. International Migration and Remittances in Asia

2.1 Asia's Global Migration Stocks

In Asia, linked through strong economic and cultural ties since the ancient times, migration has long shaped the very nature of societies in each country, while contributing to the economic prosperity, social diversity and cultural wealth. Over the last half century, international migration in the region has steadily increased, while undergoing dynamic shifts in migration patterns and trends. According to the World Bank (2011), the stock of migration has been flat between 1960 and 1970, with little changes in the patterns. Since 1980, however, it has increased at an accelerating rate. The migration stock originating from Asia has doubled in the last three decades from 28 million in 1980 to 55.7 million in 2010. Figure 1 presents migration stock originating from Asia by destination over the last five decades.

<INSERT FIGURE 1>

In the aggregate, while the stock of migration destined to South Asia has been steadily on the decline from 16 million in 1960 to around 10 million in 2010, internal migration destined to fast growing East and South East Asia has sharply increased by more than 80 percent in the last two decades. Outside Asia, migration from the region has two distinct destinations: Middle East and North America. Since the late 1970s, migration to oil-rich Middle East has steadily increased by 5.6 times from 2.1 million in 1980 to 12 million in 2010, triggered by strong labor demand. Another destination is North America, the largest destination attracting 12.6 million of migrants from Asia.

According to ESCAP (2008), recent migration trends and patterns indicate several unique aspects, reflecting economic factors, and demographic changes, and structural features. First, initial movements of Asian workers to Middle East in the 1970s have been tied to massive investment in infrastructure there. Today, the demand of migrant workers in Middle East, which continues to grow, is in other wide range of sectors.³ Second, migrants of female workers have grown rapidly, mostly bound for domestic services. In some instances, female migrants have dominated the overall flows particularly to Middle East and other destinations. Third, intra-regional migrant workers in Singapore, Malaysia, Korea, Taiwan, Hong Kong and China are no longer a cyclical phenomenon, but increasingly become a structural feature, reflecting labor market situations in these countries. Fourth, the share of high skill migrant labor is still small. However, many countries in Asia become open to accept more such workers.

³ They include agriculture, trade, tourism, services, transport, utilities and health (ESCAP, 2008).

International migration can be attributed to, among others, economic, demographic and structural factors, government policies, existing diaspora (migration network), or family linkages. Economic factor is behind international migration to Middle East and North America, whereas differences in existing demographic structure and economic disparities are dominant factor for internal migration in Asia. In the past two decades, these disparities have widened in the region. Demographic and labor market situation also matters. Some countries now face static or shrinking labor force, ageing population, rising dependency rates and declining birth rates. According to the ILO labor force projections (2009), Japan's labor force has already started declining. Over the coming decades, China's labor force will be almost unchanged, while Korea, Hong Kong, Taiwan, Singapore and Thailand will face slow growth of workforce. At the same time, dependency rates are rising fast. All of these create strong incentives to migrate for better living or higher economic returns.

2.2 Bilateral Migration Stock in 2010

Based on the World Bank (2011), Table 1 presents bilateral migration stock in 2010. This gives the overall picture of the migration stock on a bilateral basis. In 2010, the world saw international migration stock at 216 million, up from 167 million in 2000, increasing at an annual rate of 2.6 percent. This accounts for 3.15 percent of the world population. The majority of international migrants live in two geographic regions: Europe (50.7 million, 23.5 percent global share) and North America (50.5 million). In the last decade, migration stock sharply increased in these two regions: 14.6 million (40 percent rise) in European Union and 10.1 million (25 percent rise). But steep increase was seen in Middle East and Northern Africa due to booming economy, where international migrants rise by 10.3 million (55 percent increase).

<INSERT TABLE 1>

Asia is home for 24.6 million migrants as destination, sharing 11.4 percent of the global migration stock.⁴ But Asia is also the home for 55.7 million out-migrants in the world. In Asia, there are several salient migration corridors. The largest migration corridor is from China to Hong Kong (2.36 million) and Southeast Asia (1.27 million), constituting strong Chinese diaspora. Another large corridor is in Southeast Asia, between India-Pakistan and India-Bangladesh on a reciprocal way, amounting to 7.4 million migration stock. In Southeast Asia, there are also strong corridors: Indonesia-Malaysia (1.48 million) and Malaysia-Singapore (1.04 million). As Ratha and Shaw (2007) and other empirical studies

⁴ The United Nation (2006) reported that 53 million international migrants live in Asia in 2005. According to the UN regional classification, Asia includes Middle East as "Western Asia", which, in this paper, belongs to Middle East and Northern Africa, following the World Bank classification.

found, ethnic and cultural links are dominant factor for Chinese diaspora, whereas geographic distance and small income differences are key elements in migration patterns in Southeast Asia.

There are two important destinations for Asian migrants outside Asia. One is North America, essentially the United States, traditional, most attractive and highly rewarding destination. In 2010, Asia altogether sent 12.6 million migrants to North America, second largest after Latin America (24.4 million). China is the largest country sending 2.42 million migrants. This corresponds to an increase roughly to 80 percent, largest than any other countries, and accounts for nearly a quarter of an increase in migration stock in the United States in the last decade. The Philippines ranks second with 2.09 million, followed by India (1.80 million) and Vietnam (1.43 million).

Another destination is Middle East and Northern Africa. Reflecting booming economy and strong labor demand in a wide range of industries, this region has been fastest growing in receiving international migrants since 1970 (ESCAP, 2008). In fact, migration stock in this region grew from 18.6 million in 2000 to 28.9 million in 2010 at an astonishing 4.5 percent per annum. Southeast Asia is the region sending a large number of migrants—4.07 million by India, 2.24 million by Pakistan and 1.02 million by Bangladesh, outnumbering any other regions. The rest of Asia also sent 3.25 million migrants to Middle East and Northern Africa.

In contrast, Asia received only 1.51 million immigrants from outside Asia. East Asia received roughly 1.0 million migrants, out of which half came from Latin America (0.5 million), followed by North America (0.3 million). In particular, Japan alone accommodated 0.4 million immigrants originating from Latin America, whereas Hong Kong received migrants 0.24 million from non-Asian regions. In Southeast Asia, migrants amount to 0.43 million. The Philippines and Thailand are the main destinations, both together accounting for 70 percent of migrant stock from regions outside Asia.

2.3. Global Remittance Flows

Remittances are one of most visible responses of international migration. In recent years, it has been increasingly recognized that migrant remittances have profound impacts and play an important role on development process at both macro- and micro-levels. They are primarily intended to support the provision of households' basic needs. Remittances sent by migrants directly increase the income of the recipients and raise their purchasing power for consumer goods and services, while helping households to diversify their income sources. Remittances also augment household savings and investment, particularly in education and health, all of which generates a high social return. Recent studies suggest that remittances are important in reducing the incidence and severity of poverty in many developing

countries.⁵ At the macroeconomic level, remittances are also a major source of foreign earnings for some countries and are an important element of national income.

Over the last two decades, global remittances increased 7 times at an accelerating speed. In 1990, global remittances were reported at \$64 billion in terms of inflows, in which Asia accounted for 17 percent (\$11 billion). In 2000, they doubled to \$131 billion, out of which Asia received \$40 billion. This accounted for 30 percent share, a sharp rise from 1990. In 2000, India was the largest recipient of remittances (\$12.9 billion) in Asia, accounting for 30 percent of inflows in the region. In addition, the Philippines—traditional recipient—and fast growing China and Korea also received substantial amount of remittances, sent by emigrant workers. Figure 2 shows inflow remittances between 1990 and 2010.

<INSERT FIGURE 2>

In 2010, the global remittances reached \$453 billion, 3.5 times jump over the last decade.⁶ World Bank (2011) reckons that remittances sent by migrants to developing countries are three times larger than the size of official development assistance and represents a lifeline for the poor. Remittances to Asia, however, increased at much faster speed. With \$188 billion of inflows, Asia today accounted for over 40 percent in the share of global remittances. China's remittances are almost equivalent to those of India, both reporting at \$53 billion and \$54 billion, respectively.

Although remittance data are still inaccurate, empirical studies indicate that their flows are greatly influenced by several economic factors. First, migrant stocks are the greatest and most decisive element determining the flows of remittances. In other words, the size of the migrant population from countries of origin to destinations is the key determinant of bilateral remittance flows sent back to home countries. Second, compositional factors in skills and legal status also affect remittance flows. In general, low-skill migrants tend to send a larger portion of their income than high-skill migrants. Temporary workers are more likely to send a larger share of their income than permanent workers. Third, employment opportunities in host countries matter. Flexible and open labor markets in host countries enable immigrants to find better jobs or change jobs more easily. This allows them to generate additional income, which in turn will be sent back to their home countries. Finally, length of stay and wage gaps between natives and immigrants in host countries also affect remittance flows. In many host countries, there are

⁵ See, for example, Adams and Page (2003).

⁶ There are significant discrepancies between inflows and outflows, due primarily to inaccurate reporting in official transfers, and substantial amount of unofficial flows. This is particularly the case in the last decade, where outflows tend to be underreported than inflows, which have been already underreported, due to unofficial flows. World Bank reported that outflow remittances were \$115 billion, 13 percent less than the volume of inflows. The underreporting is much severe in 2010: \$302 billion of outflows, accounting only two-thirds of inflows.

persistent wage gaps between natives and immigrants.⁷ In general, the higher the skills, the narrower the wage gaps between natives and immigrants. Furthermore, the longer the work experience in host countries, the narrower the native-immigrant wage gaps.

3. Analytical Framework and Benchmark Data

3.1 Overview of the CGE Model

This study applies a multi-region, static computable general equilibrium (CGE) model. The model is neoclassical in spirit, trade-focused, and global, following Guzman and Watanuki (2012).⁸ It comprises 23 countries and regions, in which 14 countries and one region belong to Asia.⁹ In the model, labor market in each country is decomposed by nativity and origins of regions in a two-stage nested structure: natives and aggregate migrants in a top level, and migrants from high-income and low-income origins in a bottom level. To capture the impact on wages and labor income as well as migration-remittance nexus, the model incorporates three household groups corresponding to the origin of labor. All countries and regions are fully endogenized and linked only through trade, while incorporating the respective modules on international migration and remittances. The model only deals with the real side of the economy and does not consider financial or monetary markets. It is built on individual Social Accounting Matrices (SAMs) for each country and region, benchmarked at base year 2007.

Each region in the model traces the circular flows of income through factor payments from producers to institutions—households, enterprises and government—and back to final demand for goods in commodity markets. These institutions represent the respective economic agents, whose behaviors and interactions are explicitly specified in the model. Private consumption, intermediate input use, government consumption, and investment are the four components of domestic demand.

To capture the potential effects of different income-generation and consumption patterns associated with international migration, the model incorporates three types of household groups in each country: (i) native households, (ii) migrant households from high-income countries, and (iii) migrant

⁷ For some country studies, see Lang (2000) for Germany, and Izquierdo, Lacuesta, and Vegas (2008) for Spain. Borjas (2012) shows that there exist huge wage gaps between natives and migrants in the United States. But more striking evidence is that there are the large disparities in earnings in the combination of skills and nationalities. In 2000, immigrants from Jamaica earned 12.2 percent less than US natives, and Mexican or Guatemalan immigrants earned nearly 40 percent less. The majority of these immigrants belong to low skill labor. In sharp contrast, immigrants from Canada or the United Kingdom earned almost 40 percent more than US natives. Most of these immigrants are skill workers, and easily transferable to the American labor market.

⁸ Guzman and Watanuki (2012) applied a global, recursive dynamic model to Latin America, but the model structure of the core static module remains the same.

⁹ Countries and region in the model are: Japan, China, Korea, Hong Kong, Taiwan, Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam, Bangladesh, India, Pakistan, the rest of Asia, Australia-New Zealand, North America, Latin America, European Union (27), Former Soviet Union, Middle East and Northern Africa, Southern Africa, and the rest of world.

households from developing countries.¹⁰ The income-generation process is clearly differentiated between native and migrant households. Income for native households comprises several sources—wages, capital and land rents—and transfers from government, private enterprises, and firms. Unlike native households, it is assumed that migrant households, for the sake of simplicity, earn their income only from wages, but not from non-wage incomes. It is assumed, however, that migrant households living in high-income regions receive government subsidies at fixed proportion as with natives,¹¹ whereas households in low-income regions do not. Only native households receive remittances sent from migrants, thus excluding remittances among households between host countries.

On expenditures, all households pay taxes, and a large portion of expenditures are spent on consumption.¹² Consumer preferences are specified by a linear expenditure system (LES) of demand, derived from the maximization of a Stone-Geary utility function subject to the respective household budget constraints. The government collects various taxes and receives foreign transfers, allocates for goods and services, earmarks subsidies to domestic institutions, and amortizes payments to domestic and foreign lenders. Two assumptions related to migration-remittance links have been made to simplify the model. First, aggregate remittances are assumed to be a fixed proportion of migrant household incomes. Second, bilateral remittances sent to each home country are in proportion to the number of migrant workers in each host country.

For each sector, the model explicitly specifies output-supply and input-demand equations. Production is modeled in a four-stage nested structure, expressed by a Constant Elasticity of Substitution (CES) function. At the top level, domestic output is specified between aggregate intermediate input and aggregate value added, or composite primary factor. At the second stage, each intermediate input is determined by the fixed coefficients. The aggregate value added is again specified by the CES function among four factors of production: labor, capital, land, and natural resources. To accommodate imperfect substitution, the model introduces a two-stage nested structure in the labor market differentiated by origin, expressed in CES functions. At the upper stage, aggregate labor comprises native labor and aggregate migrant labor. At the lower stage, aggregate migrant labor is decomposed into workers originating from high-income and low-income countries.¹³ At all levels of the production tree, the optimal

¹⁰ In this study, high-income countries comprise advanced economies plus emerging countries in Asia, based on average wages (see table 3) and per capita GDP, and include: Japan, Korea, Hong Kong, Taiwan, Singapore, Australia-New Zealand, North America, and European Union.

¹¹ This reflects the fact that high-income countries have better social and public systems, which are, however, not necessarily the case in low-income countries.

¹² It is assumed that migrant households have the same consumption patterns as in their home countries. As a result, the sectoral demand for migrant households is derived as a weighted average of consumption of the migrant population from each country.

¹³ It would be appropriate to decompose labor market by skill group, as done in Walmsley and Winters (2005), Walmsley, Winters, and Ahmed (2007), World Bank (2006), and Guzman and Watanuki (2012). However, this

levels of each factor and labor demand are determined by firms' profit-maximization and cost-minimization decisions. Figure 3 presents the production nesting structure used in the model.

<INSERT FIGURE 3>

International trade follows standard specifications in common with other trade-focused CGE models. The model specifies a set of export-supply and import-demand equations for traded sectors, allowing national product differentiation. Both exports and imports are modeled in a two-stage nested structure. Exports are modeled in a constant elasticity of transformation (CET) function. The optimal allocation of supply is determined by revenue-maximization choices between domestic sales and aggregate export supply at the upper stage, and among exports destined for different markets at the lower stage. Imports are modeled by the CES function. The optimal allocation of demand is determined by cost-minimization choices between domestic demand and aggregate import purchases at the upper level, and imports from different markets at lower stage.

The model explicitly specifies saving and investment equations. Aggregate savings, which are pooled to finance domestic investment, are savings from domestic institutions, i.e., households, firms and government, plus capital inflows, representing foreign savings from the rest of world. Household savings are modeled as the fixed proportions of the aggregate households' income. In other words, households' saving rates or marginal propensity to save are fixed. Firms' savings are specified as residuals from their gross income less all expenses, comprising taxes and dividend payments to domestic households and foreign shareholders. Government savings are defined as the difference between revenues and expenditures at current value. Budget deficit is primarily financed through borrowing from the domestic capital market, supplemented by foreign borrowing from the rest of the world.

Aggregate investment is specified in a familiar Cobb-Douglas function. The agent's optimization process yields the optimum allocation of sectoral demand of investment by sector of origin. This optimization also generates the aggregate price of capital or price index of investment. The model follows Bourguignon, Branson and de Melo (1989), Fargeix and Sadoulet (1990), and Jung and Thorbecke (2003) for the allocation of investment and the functional ratio of capital accumulation over sectors. The investment demand by sector of destination is specified in the second order quadratic functional form. The speed of investment, defined as the ratio of investment by sector of destination over capital stock in each sector, is an increasing function of rental rate of capital and the inverse of the product of the price of capital (or price index of investment) times interest rate. The model strictly guarantees two balancing

requires tremendous work on labor decomposition and estimation of migrant labor on a bilateral basis. Given the present limited data availability and recent dynamic cross-border movements of labor, the latter poses huge challenges in estimating bilateral migration by skill component. Therefore, this study does not touch on labor market decomposition.

conditions: (i) saving-investment equality; and (ii) the aggregate investment between the sectors of origin and destination in the current value term.

In commodity markets, equilibrium is achieved through endogenous and simultaneous interactions among quantities and their corresponding prices. In factor markets, the equilibrating mechanism of demand and supply depends on how factor supply and its price, comprised of wages, rental rate, and land rent, are defined. To capture the impact on both wages and labor demand, labor supply of natives is modeled as a rising function of real wages, or nominal wages discounted by consumer price index. However, the supply of migrant labor is fixed. In other words, immigrant labor in host countries is predetermined, so that it would not be influenced by domestic conditions.

In the model, there are three key macroeconomic closures or balances: public finance; saving-investment; and external market. There are a number of different choices available. The key is which choice in each closure would be the most appropriate and realistic. In this study, for government balance, public savings are determined residually as the gap between current revenues and expenditures, while all transfers are fixed. This treatment allows fiscal surplus or deficit to adjust to balance public finance. In addition, to control possible welfare effects arising from variations in public spending, government consumption demand is fixed in real term.

For saving-investment, the current amount of (nominal) investment is completely financed by the aggregate savings in each country and region, in the absence of international capital mobility. The model applies the neoclassical “saving-driven” closure, so that private saving rates are fixed, whereas investment adjustment factor is endogenized as an equilibrating variable to maintain saving-investment balance.

For external market closure, there are two distinct options: (i) fixed trade balance, and (ii) fixed exchange rate. In the first option, trade is balanced at each country or region, valued at world prices. With fixed external capital flows and transfers, an increase in import demand due to changes in the external market must be completely financed by the increase in exports. On the other hand, the second closure is to fix the exchange rates and the external balance is free to adjust, allowing evaluation of the impact on the position of trade balance due to changes in demand at home and by partners. This option is often used for the short- to medium-run experiment, in which the exchange rate does not necessarily respond fast enough to adjust to changes in the external market. The first option is appropriate for the medium- to long-run perspective. Given these policy implications, the model applies the first closing option.

3.2 Modeling Nexus of Migration and Remittances and Labor Substitutability

Modeling Nexus of Migration and Remittances

In this paper, international migration is treated as an exogenous change in labor force on a bilateral basis. International migration is the key source of raising labor productivity for migrant workers,

which in turn improve productivity for native labor. Based on Jung and Thorbecke (2003), modeling the nexus of migration and remittances follows Guzman and Watanuki (2012), differentiated between high- and low-income countries. Specifically, labor productivity was modeled as a polynomial function of new migrant labor relative to base migrant labor powered by elasticity.

Native labor productivity λ_{ntv}^r at home is specified in equation (1):

$$\lambda_{ntv}^r = \left(\frac{\sum_s OUTMIG_{mig}^{r,s}}{\sum_s OUTMIG_{base}^{r,s}} \right)^{\eta_{ntv}^r} \quad (1)$$

where $OUTMIG^{r,s}$ is the total out-migrant labor from country r to country s , and λ_{ntv}^r stands for elasticity for native labor productivity.

Likewise, immigrant labor productivity λ_{mig}^r in host county r is defined as the function of aggregate immigrant labor $IMMIG^{r,s}$ as in equation 2:

$$\lambda_{mig}^r = \left(\frac{\sum_s IMMIG_{mig}^{r,s}}{\sum_s IMMIG_{base}^{r,s}} \right)^{\eta_{mig}^r} \quad (2)$$

These labor productivity parameters are embedded in labor demand and aggregate wage equations, as firms optimize their labor demands in the face of respective wages, operating in constant returns to scale technology under perfectly complete markets.

In the model, remittances are assumed to be a fixed proportion of the aggregate migrant household income, as expressed in equation (3):

$$ER^r \cdot FTRH_h^r = \psi_h^r \cdot YH_h^r \quad (3)$$

where YH_h^r is the aggregate household income for migrant household h in host country r , $FTRH_h^r$ is total outflow remittances sent by migrant household h , ER^r is an exchange rate, and ψ_h^r is a fixed remittance share in aggregate migrant household income.

The model assumes, for the sake of simplicity, that remittances are allocated in proportion to the number of immigrant labor from respective countries. With this assumption, bilateral remittance flows are simply specified in equation (4):

$$RM_h^{r,s} = remshr_h^{r,s} \cdot FTRH_h^r \quad (4)$$

where $RM_h^{r,s}$ is the bilateral remittance outflows send by migrant household h in host country r to home country s , controlled by bilateral remittance share parameters $remshr_h^{r,s}$, which differ between base and migration scenarios, due to exogenous changes in the stock of migration.

Finally remittances $REMIT_h^r$ native household h in home country r receives are the sum of bilateral remittance flows, sent from the respective countries s , and expressed in equation (5):

$$REMIT_h^r = \sum_{s,r} RM_h^{s,r} \quad (5)$$

Modeling Labor Substitutability and Wage Elasticity

The impact on domestic labor market has always played a central role in policy discussions and sensitive debates on immigration. This section addresses how the impact of international migration on wages is captured in a general equilibrium framework. As explained in the previous section, domestic production is modeled in a four-stage nested structure using a CES aggregate function, implying that inputs are imperfect substitutes at each stage.

In the top stage, the sectoral output X_i^r is expressed in a CES function between value added VA_i^r and aggregate intermediate inputs XZ_i^r :

$$X_i^r = AX_i^r \cdot \left[\alpha_i^r \cdot (VA_i^r)^{\rho\alpha_i^r} + (1 - \alpha_i^r) \cdot (XZ_i^r)^{\rho\alpha_i^r} \right]^{\frac{1}{\rho\alpha_i^r}} \quad (6)$$

where AX_i^r is a CES production shift parameter, α_i^r is a share parameter, and $\rho\alpha_i^r$ is a production function exponent, with the functional relation with elasticity of substitution, $\sigma\alpha_i^r = 1/(1 - \rho\alpha_i^r)$.

In the second stage, value added comprises four factors of production—labor, capital, land and natural resources—and expressed in equation (7):¹⁴

$$VA_i^r = AV_i^r \cdot \left[\sum_f \alpha_{i,f}^r \cdot (QF_{i,f}^r)^{\rho\alpha_{i,f}^r} \right]^{\frac{1}{\rho\alpha_{i,f}^r}} \quad (7)$$

where AV_i^r is a CES production shift parameter, $\beta_{i,f}^r$ is a share parameter, and $\rho\alpha_{i,f}^r$ is a production function exponent, with the functional relation with elasticity of substitution, $\sigma\alpha_{i,f}^r = 1/(1 - \rho\alpha_{i,f}^r)$.

Likewise, aggregate labor $QF_{i,lab}^r$ is specified by native labor and aggregate migrant labor in the third stage, whereas the aggregate migrant labor $LAB_{i,mig}^r$ is modeled by migrants from high-income region and low-income regions in the lowest fourth stage, in equations (8) and (9), respectively:

¹⁴ To be clear, out of four factors of production, labor and capital are the key elements used for all sectors, whereas land is used only for agriculture, and natural resources for a part of agriculture and energy.

$$QF_{i,lab}^r = AL_i^r \cdot \left[\beta l_i^r \cdot \{LAB_{i,mig}^r\}^{\rho l_i^r} + (1 - \beta l_i^r) \cdot \{LAB_{i,ntv}^r\}^{\rho l_i^r} \right]^{\frac{1}{\sigma l_i^r}} \quad (8)$$

$$LAB_{i,mig}^r = AMIG_i^r \cdot \left[\beta mig_i^r \cdot (QMIG_{i,migh}^r)^{\rho mig_i^r} + (1 - \beta mig_i^r) \cdot (QMIG_{i,migl}^r)^{\rho mig_i^r} \right]^{\frac{1}{\sigma mig_i^r}} \quad (9)$$

where $QMIG_i^r$ represents the stock of migrant labor, differentiated by countries of origin (high- and low-income countries), AL_i^r and $AMIG_i^r$ are CES shift parameters, βl_i^r and βmig_i^r are share parameters, and ρl_i^r and ρmig_i^r are labor aggregate function exponents, with the functional relation with elasticity of substitution, $\sigma l_i^r = 1/(1 - \rho l_i^r)$ and $\sigma mig_i^r = 1/(1 - \rho mig_i^r)$, respectively.

Based on “marginal productivity theory”, factor and labor demands at each stage are derived in the following equations:

$$VA_i^r = \left(\frac{1}{AX_i^r} \right)^{1-\alpha_i^r} \cdot \left[\frac{\alpha_i^r \cdot PP_i^r}{(1 + tva_i^r) \cdot PVA_i^r} \right]^{\alpha_i^r} \cdot X_i^r \quad (10)$$

$$QF_{i,lab}^r = \left(\frac{1}{AV_i^r} \right)^{1-\sigma a_i^r} \cdot \left[\frac{\beta_i^r \cdot PVA_i^r}{WA_i^r} \right]^{\sigma a_i^r} \cdot VA_i^r \quad (11)$$

$$LAB_{i,mig}^r = \left(\frac{1}{AL_i^r} \right)^{1-\sigma l_i^r} \cdot \left[\frac{\beta l_i^r \cdot WA_i^r}{WMIG_i^r} \right]^{\sigma l_i^r} \cdot QF_{i,lab}^r \quad (11)$$

$$LAB_{i,ntvi}^r = \left(\frac{1}{AL_i^r} \right)^{1-\sigma l_i^r} \cdot \left[\frac{(1 - \beta l_i^r) \cdot WA_i^r}{wldist_{i,ntv}^r \cdot WNTV_i^r} \right]^{\sigma l_i^r} \cdot QF_{i,lab}^r \quad (12)$$

$$QMIG_{i,migh}^r = \left(\frac{1}{AMIG_i^r} \right)^{1-\sigma mig_i^r} \cdot \left[\frac{\beta mig_i^r \cdot WMIG_i^r}{wldist_{i,migh}^r \cdot WL_{migh}^r} \right]^{\sigma mig_i^r} \cdot LAB_{i,mig}^r \quad (13)$$

$$QMIG_{i,migl}^r = \left(\frac{1}{AMIG_i^r} \right)^{1-\sigma mig_i^r} \cdot \left[\frac{(1 - \beta mig_i^r) \cdot WMIG_i^r}{wldist_{i,migl}^r \cdot WL_{migl}^r} \right]^{\sigma mig_i^r} \cdot LAB_{i,mig}^r \quad (14)$$

where PP_i^r and PVA_i^r are prices of average output and value added; WA_i^r is aggregate sectoral labor wage, $WNTV_i^r$ is native labor wage, $WMIG_i^r$ is aggregate migrant labor wage, and WL_i^r is migrant labor wage, differentiated by countries origin (high- and low-income countries); $wldist_i^r$ represents the sectoral wage differentials and tva_i^r is an *ad valorem* tax rate applied for primary factors.

By definition, “wage elasticity” of labor supply is defined by percentage changes in wages W in response to percentage changes in the supply of labor L (native or migration), keeping marginal costs and other factors constant. It is then formally specified as:¹⁵

$$\varepsilon_{w,l} = \frac{d \log W}{d \log L} = \frac{\hat{W}}{\hat{L}} \quad (15)$$

In a four-stage CES production technology, the own “wage elasticity is derived from differentiating inverse demand function with respect to own quantity (labor demand), and substituting it in the nested structure sequentially four times. Equation (16) expresses the wage impact of an increase in the supply of labor on its own wages at the bottom stage. This is the complete functional form expressed only by elasticity of substitutions and share parameters at each stage (omitting sectoral and regional notations):

$$\begin{aligned} \varepsilon_{w,l} = & -\frac{1}{\sigma_{mig}} + \left(\frac{1}{\sigma_{mig}} - \frac{1}{\sigma} \right) \cdot \theta_{mig} + \left(\frac{1}{\sigma} - \frac{1}{\sigma_{va}} \right) \cdot \theta_{mig} \cdot \theta \\ & + \left(\frac{1}{\sigma_{va}} - \frac{1}{\sigma_x} \right) \cdot \theta_{mig} \cdot \theta \cdot \theta_{va} + \frac{1}{\sigma_x} \cdot \theta_{mig} \cdot \theta \cdot \theta_{va} \cdot \theta_x \end{aligned} \quad (16)$$

where θ_{mig} is the share of income accruing to migrant labor (either high- or low-income origins) at the bottom stage, θ is the share of income accruing to the migrant labor at the third stage, θ_{va} is the share of income accruing to the aggregate labor at the second stage, and θ_x is the share of income accruing to value added at the top stage. This equation is exactly the same functional specification as in Borjas (2003) and Ottaviano and Peri (2005) in a three-stage nested structure.¹⁶ For the cross wage elasticity, namely the impact of an increase in migrant labor on native wages, is then expressed in equation (17):

$$\varepsilon_{w,l'} = \left(\frac{1}{\sigma} - \frac{1}{\sigma_{va}} \right) \cdot \theta + \left(\frac{1}{\sigma_{va}} - \frac{1}{\sigma_x} \right) \cdot \theta \cdot \theta_{va} + \frac{1}{\sigma_x} \cdot \theta \cdot \theta_{va} \cdot \theta_x \quad (17)$$

As shown in equation (16) and (17) shows, wage elasticities are significantly influenced by (i) elasticity of substitution, and (ii) income shares at each level, but the lower the stage, the greater the magnitude.¹⁷ While these elasticities provide important insight of the direction on wages for native workers, they do not provide the total effects of immigration on wages for natives, although immigration affects native wages through both “own” and ‘cross” wage elasticities, derived in the equations. Besides in

¹⁵ See Hamermesh (1993), based on the derivation by Allen (1960).

¹⁶ In estimating wage elasticities, Borjas (2003) and Ottaviano and Peri (2005) held marginal cost, quantities of other factors and total production constant, applying in a partial equilibrium framework. See also Sato (1967), Bowles (1970), Grossman (1982), and Card and Lemieux (2001) for deriving and estimating the elasticity of substitution in a two-level CES function.

¹⁷ The parameter values of elasticity of substitutions in the model were drawn from Card and Lemieux (2001), Borjas (2003) and Ottaviano and Peri (2005), and range from 2 to 5, differentiated by countries and sectors.

reality, outputs change, as firms readjust factor inputs and allocations in facing changes in factor returns. However, it is clear that the first term in each equation has the dominant effects on wages, because the other terms are multiplied by factor shares. This implies that “own” elasticity effects are clearly negative, whereas cross elasticity effects depend on the difference of the inverse of income shares between second and third stages, and might be positive, due to complementarities. In other words, the influx of migrant labor would have potentially positive effects raising wages of native workers, if other things being equal, as Ottaviano and Peri (2005) demonstrated.

3.3 Benchmark Data: Labor Force and Remittances

This section briefly outlines labor force between natives and migrants differentiated by country of origin and remittances at benchmark. They are two key determinants, influencing the simulation results.

Structures of Labor Force and Wages

Based on ILO Labor Statistics (LABORSTA)¹⁸ and the migration database (World Bank, 2011), the structure of labor force by origin was examined. In 2007, the global labor force was approximately 3.1 billion (46 percent of the global population), increasing at a 1.65 percent growth rate per annum since the onset of this century.¹⁹ Out of this figure, the labor force of 537 million lived in high-income countries, constituting 17 percent of the global total.²⁰ Asia is home of 1.9 billion workers, constituting 57 percent of the world labor force. Table 3 shows the labor force structure by country of origin.

<INSERT TABLE 3>

The composition of labor force by origin differs considerably country by country. However, there are two salient features applicable in Asia and elsewhere. First, high-income countries tend to be more reliant on migrant labor than developing countries. Traditional migration destinations, North America and European Union, rely 18 percent and 13 percent of their labor force on migrants, respectively. In Australia-New Zealand, migrants account for 30 percent of the labor force. In Asia, roughly half of labor force is dependent on migrants in Hong Kong and Singapore.²¹ Although belonging to high-income countries, Japan, Korea and Taiwan are exceptions, where migrants account for three percent or less.²²

¹⁸ Accessed in May 2011.

¹⁹ Labor force growth in Asia is slightly lower than the global rate. This is because the most populous China has the lowest growth rate in Asia except Japan, where labor force has started to decline since the middle of the last decade.

²⁰ See footnote 10, for the definition of high-income countries used in this study.

²¹ Around 80 percent of the labor force in Hong Kong are Chinese, whereas more than half the labor force in Singapore are from Malaysia, and another quarter from China.

²² Tight immigration policy and anti-immigration sentiment would be main reason of low migration in Japan, Korea and Taiwan.

Second, small countries are more reliant on migrant labor: again Hong Kong, Singapore and Australia-New Zealand. The opposite is also true. Due to abundant labor force at home, large countries, which coincidentally belong to developing countries, are less dependent on migrants. Natives almost entirely account for domestic labor force in most populous China and India, followed by Indonesia. In Former Soviet Union and Middle East/Northern Africa, migrant labor mostly within each region constitutes over 10 percent of the regional labor force.

Table 3 also presents average wages differentiated by home (native) and migrant workers. It reveals several features associated with nativity and origins of migrant labor. First, wages for native workers tend to have narrow variations among high-income countries. This is particularly the case in advanced countries such as Japan, Australia-New Zealand and North America.²³ In Asia, native wages in Hong Kong and Singapore are almost equivalent to the average wages of high-income countries, whereas in Korea and Taiwan, emerging economies in Asia, native wages are still around the half.

Second, in high-income countries, wage variations between natives and migrant workers from high-income origins are relatively small. This is largely because most migrants from high-income origins are skill workers, and they would be relatively easily transferable to native workers. Likewise, wages variations for workers from high-income origins are also relatively small irrespective of where they work and where they are from.

Third, there are considerable wage differentials among migrant workers, particularly between high-income and low-income origins. This wage gap between high- and low-income origins is less than 40 percent in most high-income countries—Japan, Taiwan, Australia-New Zealand, North America and European Union. The exceptions in high-income countries are Singapore and Korea, where wages for workers from high-income origins are twice as large as those from low-income origins in Singapore and almost three times in Korea. In sharp contrast, the wage gap is sizable in low-income countries. The gaps in India and Pakistan are over 20 times greater, whereas it reaches 30 times in Bangladesh.

Remittances in Household Income

For the sake of simplicity, this study applied simple income generation processes for migrant households. In developing countries, wages are the only income source for migrant households. In high-income countries, in addition to wage income, migrant households are assumed to receive some public supports as native households do. This is because high-income countries have better social security, benefits and other supporting systems, and they are assumed to be applicable to long-term migrants or resident foreigners.

²³ In the European Union, its average wages are some 60 percent of other advanced countries. This is because the present European Union includes 12 new entrants formerly belonging to Eastern Europe. Wages excluding these countries almost match the average wages among high-income countries.

This study also applied several key assumptions regarding remittances. First, only migrant families, irrespective of where they are from or where they stay, send remittances back home. Second, remittances between third countries are not considered.²⁴ Third, native households do not send remittances to support their families in host countries. All of these are based on the assumption that remittances are made solely by international migration, namely as a function of stock of migrant workers, not motivated by any other economic factors or social considerations.

Based on these assumptions and observed data with some adjustments, the economic importance of remittances in household income was examined in two ways. First is related to remittance ratio in household income, defined as the ratio of remittances in aggregate migrant households' income. Clearly there are huge variations. Migrant families from high-income origins have low remittance ratio, less than 10 percent, irrespective of their origins. In Asia, the ratios range from two percent in Bangladesh to eight percent in Malaysia. However, this ratio varies widely for migrant families from low-income countries. This is particularly the case when host countries are low-income developing destinations. In China, Indonesia, Malaysia, Thailand, India and Pakistan, migrant households from low-income origins send around 40 percent or more of their income to their home. Outside Asia, Middle East/Northern Africa and Southern Africa also have high ratios beyond 40 percent, followed by Latin America (38 percent). Figure 4 presents remittance ratio in households' income.

<INSERT FIGURE 4>

The importance of receipt of remittances in household income also varies country by country. However, there are some common aspects. Remittances are important sources as household income for small and low-income countries, which tend to have high emigration rates. Remittances constitute the largest 10 percent of household income in the Philippines, followed by Vietnam (9 percent). For these countries, North America is the main host destination for their emigrant workers. In Bangladesh, the ratio is 8.5 percent. Migrant workers to neighboring India dominate to support families in Bangladesh. For the rest of Asia, migrants to Middle East/Northern Africa contribute to support families at home, for which remittances account for around 7 percent of the household income.

4. Policy Scenarios and Simulation Results

4.1 Migration Policy Scenarios

²⁴ For instance, family members migrate to country A and B. As a result, it is assumed that these migrants in country A and B will send remittances separately to home country. But they are not considered to send remittances between country A and B to support each other.

In this study, changes in international migration stock are considered as the policy shocks. Based on recent migration trends and patterns, this study considers exogenous changes in international migration stock in three scenarios (destinations): (i) North America; (ii) Middle East/Northern Africa; and (iii) intra-Asia. The change in migration considers three percent to each destination relative to the benchmark on a bilateral basis, the magnitude equivalent to long-term share of migration in the global population.

Scenario 1: North America

This scenario considers North America, traditional migration destination growing fast, in the south-north pattern. Each country in Asia increases its migrant labor force to North America by three percent, while losing labor force at home. The United States would increase by 239 thousand migrant workers, decomposed by 46 thousand from high-income countries and 193 thousand from low-income countries. By country of origin, the changes in labor force at home are 47 thousand in China, 40 thousand in the Philippines, 35 thousand in India, 28 thousand in Vietnam, 22 thousand in the rest of Asia and 20 thousand in Korea. This out-migrant labor force, however, is a small fraction of the native labor force, with the largest change by 0.5 percent in Hong Kong, followed by 0.1 percent in the Philippines. Table 4 displays changes in labor force by country.

<INSERT TABLE 4>

Scenario 2: Middle East and Northern Africa

This scenario considers Middle East and Northern Africa as the destination for Asian migrant workers, in the south-south migration pattern, based on the recent strong trend. Middle East/Northern Africa receives 225 thousand new migrant workers from Asia. South Asia is the primary source sending migrant workers: India (75.8 thousand), Pakistan (41.6 thousand), and Bangladesh (19 thousand). The rest of Asia collectively sends around 60.5 thousand workers.

Scenario 3: Intra-Asia

This scenario focuses on intra-Asia migration in a four-way migration patterns, as opposed to the previous two scenarios, which serve as references. This is the central scenario designed to evaluate the potential economic outcomes in burgeoning Asia. The changes in the migrant stock are zero-sum within Asia, but are considerably dynamic on a bilateral basis. In the aggregate, native labor in Asia decline by 436 thousand, which are primarily offset by the increase in migrant labor from low-income origin (417 thousand), supplemented by high-income origin (19 thousand). There are three distinct patterns. First is the group with a decline in total labor, in which out-migrant labor outnumbered immigrant labor by a large degree. China loses aggregate labor force by 92 thousand, followed by Bangladesh (59.6 thousand) and India (31.1 thousand). Korea, Philippines and Vietnam are also grouped in this category, but with a

smaller magnitude. Second is the opposite pattern, namely, immigrant labor outpaces out-migrant labor at home. Hong Kong increases the largest labor force by 53.4 thousand, followed by Singapore (31.5 thousand) and Japan (30.7 thousand). Malaysia, India and Pakistan also belong to this pattern. Third is the pattern, in which out-migrants are roughly balanced with immigrant labor force. This includes the rest of Asia, where the decline in native labor is met by an increase in migrant workers.

4.2 Simulation Results

Aggregate Impact on Macroeconomic Variables

Table 5 shows the impact of three migration simulations on macroeconomic variables. In scenario 1, a 3 percent increase in migrant labor to North America would generate positive effects in Asia, the largest among three scenarios. The region's aggregate GDP would rise by 0.7 percent, equivalent to \$87.6 billion at 2007 prices. Although all countries in Asia benefit from virtuous nexus of migration-remittance, the positive effects would be uneven among countries. Taiwan would benefit the most, with the largest 2.3 percent gain in its GDP, followed by Hong Kong (1.6 percent) and Korea (1.3 percent), all of which belong to high-income countries. Several factors, generated by the virtuous cycle of the migration-remittance nexus, are behind these strong effects.

<INSERT TABLE 5>

First is home factor effect on native wages. Due to decline in labor force at home, native wages in Asia would rise. However, the increase in wages outpaces the decline in labor supply at home, so that aggregate labor income would increase. Second is the opposite case in North America, migration-recipient destination. Wages for migrant labor would decline, as its supply increases. However, the supply of migrant labor outpaces the decline in wages, so that migrant labor income increases. The effect on native labor in North America precisely follows equation (17). An increase in migrant labor force would, albeit being marginal, push up native wages, not push down.²⁵ Third, Korea, Hong Kong and Taiwan account for large shares in new immigrant labor force originating from high-income countries: 44 percent for Korea, and around 20 percent each for Hong Kong and Taiwan. As a result, these countries are large beneficiaries in remittances sent from North America. The same is also true for the Philippines and Vietnam, belonging to low-income countries, but with a smaller degree.

Asia's economic gains offset loss outside Asia, contributing to a modest increase in the global macroeconomic variables. North America with an increase in migrant workers in production process, supplemented by labor productivity, would have positive effects, although being small. In Asia, Japan

reaps around 40 percent of net GDP gains (\$34.4 billion), due to its large economic size, followed by China (\$16.6 billion) and Korea (\$14.1 billion). The European Union would experience the largest losses, amounting to \$25 billion (minus 0.15 percent).

Despite similar size of changes in migration, the impact in scenario 2 is far different from the one in scenario 1 in two ways. First, the magnitude of impact is fairly small. The aggregate impact on macroeconomic variables is one order down from scenario 1. This outcome is consistent with the previous global analyses.²⁵ Namely, the south-north migration is the dominant channel for developing countries to reap greater income gains from migration, contributing to raise the global welfare. Second, the south-south migration pattern would not necessarily generate positive effects for many migration-sending countries in the region. Countries in South Asia benefit from this migration scenario, increasing GDP by around 0.6 percent, greater gains than under scenario 1. However, the economic impact on other countries would be negligible or negative, albeit being fairly small, reflecting low levels of migration. Migrant-recipient Middle East/Northern Africa would increase its national wealth, whereas other regions would be likely to lose.

Scenario 3 shows that Asia would benefit from intra-regional migration. Promoting intra-Asia migration stimulates higher growth in Asia, generated by virtuous circle and dynamic linkage between migration and remittances. In the aggregate, Asia's GDP would increase by 0.58 percent. Despite the changes in migration stock is 80 percent larger in scenario 3 than in scenario 1, the impact on the regional GDP is 80 percent smaller than in scenario 1. This outcome reflects the difference in migration stock to high-income destinations that offer high wage remunerations to migrant workers, which in turn can send larger remittances to home countries. Migrant workers destined to high-income countries in scenario 3 are 140 thousand, in contrast with 240 million in scenario 1.

The simulation results suggest that countries reliant on immigration tend to gains more than those on less open to international labor movements. Singapore, one of two small countries most reliant on migrant labor, would enjoy the largest 2 percent increase in GDP. Hong Kong, another small country dependent on migration, would also enjoy booming economy, increasing its GDP by 1.2 percent. Malaysia with 13 percent reliant on migration would be a beneficiary, raising its GDP by 1.5 percent, slightly larger gains than Hong Kong. Indonesia and Bangladesh benefit from Asian migration, but by different migration patterns. Japan and China, two economic giants in Asia and least dependent on migration, would also experience modest growths.

²⁵ In case the inflow of migrant labor force were far greater, there might be a chance of negative impact on wages for native workers, dragged down by negative impact on wages for migrant workers, who are considered to be imperfect substitutes to native workers.

²⁶ See the Walmsley and Winters (2005), Walmsley, Winters, and Ahmed (2007), World Bank (2006), and Giordano and Watanuki (2012).

Evaluation on Labor Market and Distributive Impact in Scenario 3 (Asian Migration)

This section examines in some detail the impact of migration within Asia, most vibrant region in the world, focusing on labor market: wage remunerations and household income.

Impact on Wages and Other Factor Remunerations

Table 6 contrasts the changes in migrant labor force between immigrants and out-migrants by nativity and destination. The magnitude of immigrants and the decline in native labor has dominant effects on native wages, as analyzed in equation (17) under the *ceteris paribus* framework. Out-migrant labor is, on the other hand, the key source generating additional income for migrant households in host destinations, which in turn the source of increased remittances, while contributing to raise productivity through the channel of diaspora.

<INSERT TABLE 6>

Out-migrant labor force shows three distinct patterns. First is the huge migration to neighboring low-income destinations. This is particularly the case with countries in South Asia (163 thousand) and Indonesia (29 thousand) in Southeast Asia. The second is the opposite case, in which the majority of workers migrate to high-income destinations: China to Hong Kong (47 thousand); Korea to Japan (11 thousand); and Malaysia to Singapore (19 thousand). Third is the group, in which out-migrant labor is relatively balanced between high- and low-income destinations. This includes Philippines, Singapore, Thailand, Vietnam in Southeast Asia, plus Japan. Hong Kong is an exception. Although the changes in migrant numbers are smallest, around 90 percent move to low-income countries in Asia.

Table 7 presents the impact on wages and remunerations on other factors. The changes in labor force due to migration affect native wages, as examined in the wage elasticities. Because native labor force declines in each county in Asia as a result of emigration despite an increase in migrant labor, native wages would rise, albeit being small, not fall. There would be several factors behind this outcome. One of factors, different from partial equilibrium framework, is that the nexus of migration-remittances would generate positive income generation effects, which in turn increase the national economy. As an economy expands, outputs increase to meet an increased demand at home so that wage remuneration would be positive for native workers, the largest labor category.

<INSERT TABLE 7>

Another factor is destination to where native labor migrates. As empirical studies and reference scenarios show, labor-sending countries would benefit more from high-income destinations than low-income ones, once an integral effect of migration and remittances is captured. In Asia, this outcome is

clearly contrasted between Singapore and Hong Kong. Singaporean workers move to Hong Kong (1.3 thousand or 40 percent of out-migrant labor), another high-income destination, whereas only 10 percent of migrants from Hong Kong migrate to high-income destinations in Asia. The positive income effect induced by remittances is stronger in Singapore than in Hong Kong. This is also the case in Malaysia, where around 90 percent of domestic workers move to Singapore and other high-income destinations.

The impact on wages for migrant workers is mixed, but mostly positive. Since migrant labor for low-income origins increases by roughly three percent in each host country, this lowers wages of this labor category in host destinations: Hong Kong, Japan, China, Vietnam, Philippines and some other countries in this order. This outcome follows what wage elasticity of its own predicts in equation (16). But the growth in economy needs to be met by either at least one of or combination of the following conditions: gains in productivity; an increase in resources, pushing up production possibility frontiers; or the rise in factor remunerations. However, given limited positive effects from the first two elements, the economic growth would be achieved by the increase in factor remunerations, including wages. This outcome is the case in Indonesia, Bangladesh and Singapore. Wages for migrant workers from high-income origin would have complementary effects with native labor. By the same token, migrant wages from low-income origin would increase by more than 1 percent in Korea, Singapore and South Asia.

Remunerations for other factors are positive. The rent on capital, another key factor in production, would increase, but with greater heterogeneity among countries. This suggests that given low sustention between capital and labor, complementary effects to meet increased outputs outpace substitution effect with labor. Capital rent would increase by 2 percent in Singapore, followed by Malaysia (1.3 percent) and Hong Kong and Indonesia (1.0 percent respectively).

Impact on Factor Income

Table 8 presents the impact on factor income. Labor income, the largest income category, increases by modest 0.47 percent in Asia, equivalent to \$28.8 billion. This means that each country in Asia would expect positive income generation process, which is the key element in raising household income. An increase in labor income is attributed to two factors, as examined in Tables 6 and 7. For native labor income, the rise in wages outpaces decline in domestic labor force. Indonesia would be the largest beneficiary with a labor income gains by 1.2 percent in native labor income, followed by Bangladesh (0.8 percent). In contrast, the increase in the supply of migrant labor would outpace changes in wages in all countries in Asia, leading to robust income gains for migrant households. In particular, households from low-income origin would benefit the most from increased income by more than three percent in Korea, Indonesia, Malaysia, Singapore, Bangladesh and India.

<INSERT TABLE 8>

The changes in capital income, another important income, would also rise. In Asia, additional capital income gains would reach \$24.5 billion, somewhat smaller than aggregate labor income gains. Reflecting the changes in its return, the impact would be asymmetric in Asia. Singapore would enjoy the largest income gains in capital by 2 percent. Hong Kong, Indonesia, Malaysia, and Bangladesh also expect gains over one percent. On the other hand, additional capital income gains would be slow in Japan, Taiwan, Philippines, and Vietnam.

Impact on Household Income

With changes in the stock of international migration, it would be best to evaluate the potential impact on household income rather than the national account. This is because households are the primary beneficiaries from the positive effects arising from migration-remittance nexus. They are also the primary recipients of remittances, at the cost of losing working-age family members at home.

Corresponding to labor categories, households are disaggregated into three groups in each country: native households; migrant households from high-income countries; and migrant households from low-income countries. The simulation found that international migration generates additional \$35 billion household income, equivalent to a small 0.36 percent of the aggregate household income in Asia. Out of this gain, \$31 billion, or approximately 90 percent, would accrue to native households. It is reminded that households' income for non-Asian countries is negative. Table 9 shows changes in household income.

<INSERT TABLE 9>

For native households, labor income generated by wage remunerations would be the main source of new income, which would amount to \$25 billion. However, reflected by initial income structure, the composition of new household income considerably differs country by country. In general, countries less reliant on migrant labor and low dependency on remittances have larger share in labor income. In Korea and Taiwan, gains from labor income account for around 90 percent, followed by Japan and China with around 85 percent share each. Figure 5 presents the composition of additional household income gains for native households by income component.

<INSERT FIGURE 5>

The salient opposite is the case in small countries heavily reliant on migrant workers, in which capital income constitutes a large share. In Hong Kong, labor income accounts for 53 percent, whereas capital income has 45 percent share in an additional income. In Singapore, capital income would make up around 70 percent, with the rest coming from labor income. For Philippines and Bangladesh, two

countries most dependent on remittances in national account (see Table 2), remittances continue to be a lifeline for native households, accounting for 18.5 percent and 20 percent in new household income, respectively. Remittances are also an important source of income for Vietnam, India, Pakistan and countries in the rest of Asia, ranging from five percent for India to 11 percent for the rest of Asia.

In the aggregate, migrant households increase their income by \$3.75 billion, which constitutes a ten percent income share. However, the growth effects of income gains would be greater for migrant households than natives, due to strong labor income gains (see Table 8). Household income for migrants from high-income origin would rise by 1.4 percent and for migrants from low-income origins by 2.0 percent. This income growth is contrasted with a 0.3 percent increase by native households. In Korea, Indonesia, Malaysia, Bangladesh, and India, household income for low-income origins would increase by more than three percent.

The contribution of migrants' new household income at the national levels differs tremendously country by country. In migrant-dependent Hong Kong, income gains generated by migrant households, largely by low-income origins, would constitute more than 70 percent of the national gains. In Singapore, their income gains account for nearly a half of the country's new income gains, followed by Malaysia (36 percent) and Taiwan (23 percent)

5. Summary and Conclusion

The past three decades have witnessed the surge in international migration in Asia. While the region has been long engaged in economic, social and cultural ties inside and with outside the region, the recent dynamic economic and demographic transformations have created incentives for people to move for better life, better living and gainful jobs within their own countries or beyond borders. While international migration to North America and Middle East has been increasing, intra-regional migration has become an important economic and social development agendas in the region. While reflecting historic backgrounds, driving force of the recent migration in Asia is greatly attributed to the current economic and demographic differences in the region.

While recent empirical studies suggest that cross-border labor mobility would generate significant benefits to both sending and receiving countries, enhancing transfer of knowledge, absorbing new technology, promoting investments, improving productivity, increasing income, creating new employment, and contributing to higher economic growth. Despite potential and promising benefits, there is a dearth of comprehensive studies quantifying potential gains from the nexus of migration and remittances in Asia. This study aims to fill knowledge gap in this policy area from the Asia's perspective.

The simulation results show international migration would generate welfare gains for migrants, their countries of origin, and destination countries. Countries of destination matter. International

migration to high-income destination would generate greater returns in wages for migrant workers. Intra-Asia migration would also generate positive welfare effects for all countries. The impact on wages for natives would be positive, whereas it would be mixed for migrant workers, but mostly on positive. In Asia, aggregate household income would increase by \$35 billion. Mechanism of new household income gains differs between natives and migrants. An increase in native household income is contributed by the rise in wages, which outpace the decline in labor supply. The opposite is the case for migrant households. The increase in the supply of migrant labor surpasses the decline or marginal changes in wages. In most countries, native households account for large share in new income gains, whereas migrant households enjoy fast income growth.

It should be noted that these potential gains arising from the migration-remittance nexus depend on several key assumptions, model specifications, and their parameter values. From the perspectives of developing countries, however, there are a couple of crucial factors. First is labor substitutability between native and migrant workers. This is a dominant factor to decide who will gain from international migration. The higher the substitutability, the more gains accrue to migrants. For developing countries, this implies how the open and flexible labor market would be mostly in high-income countries. The second is the degree of flexibility or responsiveness of the labor market. Wages at home would likely increase, as native workforce decline as a result of emigration. The critical issue becomes how labor supply responds to changes in wages. Third, the study does not consider “circular” migration, in which migrants move between destinations. In addition, it does not also take into account return migration, moving back to home country, as brain gains. These phenomena have been on the rise in Asia,²⁷ and this has been recognized to be an important policy issue.

Another important aspect is that the simulation results do not incorporate and capture social and political considerations, or migration-induced indirect effects. Changes in migration laws or reforms, particularly in high-income countries, have tremendous impact on south-north migration flows. Many empirical studies indicate that temporary migrants tend to send a larger amount of their incomes as remittances than do more permanent migrant households. Migrants are also the sources of knowledge transfer to home countries. Returning emigrants facilitate the catch-up process of acquiring new knowledge and technology. Both outgoing migrants and returning migrants could increase investment and create new businesses and business networks, linking both high- and developing countries through diaspora. Once these effects are fully considered, the potential gains become much larger than what is quantified here.²⁸

²⁷ See, for instance, the article “the magic of diasporas”, dated on November 19, 2011, the Economist.

²⁸ See Hamilton and Whalley (1984); Moses and Letnes (2004); Iregui (2005), Klein and Ventura (2007), and Clemens (2011). In sharp contrast with the full removal of merchandise trade or capital flows, these studies suggest

Finally, further work is still required, particularly on data for migration and remittances. The most essential is accurate data on bilateral international migration. In addition, data on skill decomposition is essential for both migrant workers and native labor. With due consideration and elaboration, the migration-remittance nexus should be further examined on the composition of labor (skill, gender and education), migrant family structure (young or adult, single or family), length of stay, degree of return migrants, etc.

that the complete elimination of all barriers to labor mobility would generate sizable global gains, ranging from 67 percent to almost 150 percent of the global GDP.

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Table 1. Stock of Bilateral International Migration (2010)

(1,000)

Origin \ Destination	Asia					Outside Asia					Sub-total	Total
	East Asia	Southeast Asia	South Asia	Rest of Asia	Sub-total	Australia-New Zealand	North America	European Union (27)	Middle East/Northern Africa	Other Regions		
Japan	32.56	60.93	0.85	1.01	95.36	61.51	387.94	151.29	3.66	110.42	714.82	810.18
China	3,334.50	1,268.38	36.73	332.73	4,972.32	404.01	2,418.81	839.61	83.73	134.71	3,880.88	8,853.20
Korea	706.97	10.40	0.00	0.98	718.35	110.49	1,205.51	121.79	1.70	45.46	1,484.96	2,203.30
Hong Kong	1.73	4.60	0.32	21.85	28.51	105.16	493.71	121.42	0.07	3.38	723.74	752.25
Taiwan	13.54	39.74	0.20	0.58	54.05	0.01	556.43	5.49	0.27	35.53	597.73	651.78
Indonesia	160.84	1,616.50	1.05	20.56	1,798.95	75.72	108.01	202.81	404.13	9.14	799.80	2,598.75
Malaysia	125.77	1,061.39	16.58	87.61	1,291.35	143.34	85.39	90.73	5.71	2.72	327.89	1,619.23
Philippines	393.36	319.03	0.00	28.84	741.23	178.66	2,087.06	430.49	976.29	104.60	3,777.09	4,518.32
Singapore	87.52	91.96	5.19	3.91	188.59	49.38	44.04	43.90	0.48	2.06	139.87	328.45
Thailand	248.08	88.31	0.00	142.39	478.79	49.86	193.23	187.53	26.07	22.80	479.48	958.27
Vietnam	128.94	57.35	0.73	192.94	379.96	215.31	1,428.83	302.78	0.04	30.19	1,977.15	2,357.11
Bangladesh	19.31	170.74	3,888.71	3.65	4,082.42	23.41	198.40	337.08	1,022.39	3.75	1,585.04	5,667.46
India	113.67	267.86	3,579.17	1,055.18	5,015.88	218.40	1,796.38	841.80	4,073.83	103.22	7,033.62	12,049.50
Pakistan	46.94	53.05	1,287.49	27.61	1,415.08	26.10	470.17	757.83	2,236.02	43.89	3,534.00	4,949.09
Rest of Asia	213.79	587.54	990.36	47.71	1,839.41	214.62	1,137.77	785.30	3,252.96	119.02	5,509.67	7,349.07
Asia	5,627.53	5,697.78	9,807.37	1,967.56	23,100.24	1,875.98	12,611.69	5,219.85	12,087.34	770.89	32,565.75	55,665.98
Australia-New Zealand	78.34	31.55	1.16	4.76	115.80	559.99	136.99	268.02	6.29	46.31	1,017.61	1,133.41
North America	184.64	93.93	6.38	1.91	286.87	161.76	1,202.81	829.21	143.03	1,177.67	3,514.48	3,801.35
Latin America	456.10	45.45	1.15	2.84	505.54	123.72	24,385.27	4,566.63	53.52	4,776.12	33,905.26	34,410.79
European Union (27)	107.09	121.00	12.88	9.97	250.94	2,808.30	6,470.25	18,358.32	1,830.06	3,892.45	33,359.37	33,610.31
Former Soviet Union	110.85	20.71	2.70	5.42	139.69	57.07	1,332.94	3,358.08	1,673.53	26,119.31	32,540.93	32,680.62
Middle East-Northern Africa	30.14	81.80	31.05	2.65	145.65	333.99	1,984.81	10,310.47	12,079.03	445.52	25,153.83	25,299.48
Southern Africa	12.54	15.88	11.55	2.01	41.99	383.00	1,562.96	4,162.25	930.17	16,096.01	23,134.38	23,176.37
Rest of World	3.45	16.00	0.54	0.07	20.07	479.42	801.69	3,606.40	63.23	1,014.47	5,965.20	5,985.26
Outside Asia	983.16	426.33	67.41	29.65	1,506.54	4,907.24	37,877.72	45,459.37	16,778.86	53,567.86	158,591.05	160,097.59
World	6,610.68	6,124.11	9,874.78	1,997.21	24,606.78	6,783.22	50,489.41	50,679.22	28,866.20	54,338.75	191,156.80	215,763.57

Sources: World Bank (2011).

Note: Migration stock over 1 million from Asia is highlighted.

Table 2. Macroeconomic Indicators (2007)

	GDP (\$billion)	Growth Rate 00-07 (%)	Per capita GDP (\$)	Population (million)	Remittances (\$billion)		Remittances/ GDP (%)
					Inflows	Outflows	
Japan	4,378	1.56	34,365	127	1.58	4.04	0.04
China	3,494	10.80	2,629	1,329	38.59	4.37	1.21
Korea	1,049	4.68	21,876	48	6.81	10.20	0.71
Hong Kong	207	4.86	29,806	7	0.32	0.39	0.17
Taiwan	393	4.20	17,123	23	*	*	
Indonesia	432	5.07	1,924	225	6.17	1.65	1.57
Malaysia	187	5.14	7,033	27	1.56	6.39	0.92
Philippines	149	4.97	1,684	89	16.30	0.04	12.01
Singapore	168	5.90	37,506	4	*	*	
Thailand	247	5.09	3,687	67	1.64	*	0.73
Vietnam	71	7.75	825	86	6.18	*	9.57
Bangladesh	68	5.74	434	158	6.56	0.00	10.55
India	1,242	7.70	1,067	1,165	37.22	2.06	3.30
Pakistan	143	5.26	827	173	6.00	0.00	4.61
Rest of Asia	103	7.66	594	173	5.28	2.03	5.65
Asia	12,333	4.37	3,333	3,701	134.20	31.18	1.20
Australia-New Zealand	995	3.29	39,731	25	4.48	4.30	0.50
North America	15,419	2.39	45,135	342	5.10	51.65	0.04
Latin America	3,743	3.09	6,576	569	63.30	3.94	1.86
European Union (27)	16,957	2.27	34,379	493	101.28	95.35	0.66
Former Soviet Union	1,692	7.42	6,107	277	16.53	23.35	1.07
Middle East-Northern Africa	2,613	4.61	5,985	437	34.55	39.36	1.45
Southern Africa	878	5.14	1,093	803	20.67	4.10	2.59
Rest of World	1,037	2.23	23,013	45	13.77	21.22	1.46
World	55,666	3.14	8,319	6,692	393.88	274.45	0.78

Sources: World Bank (2012) for GDP.

ILO (2009) for Population.

World Bank (2011) for Remittances.

* Data is not available in the datasets.

Table 3. Structure of Labor Market (2007)

	Labor Force (million)				Composition of Labor Force (%)				Groth of Labor Force: 00-07 (%)	Wages (\$1,000)			
	Native	High-income origin	Low-income origin	Total	Native	High-income origin	Low-income origin	Total		Native	High-income origin	Low-income origin	Total
Japan	65.23	0.45	1.03	66.72	97.78	0.67	1.55	100.00	-0.17	37.83	41.33	25.60	37.66
China	777.56	0.06	0.12	777.74	99.98	0.01	0.02	100.00	0.94	1.89	38.13	2.50	1.89
Korea	23.75	0.05	0.31	24.11	98.52	0.19	1.28	100.00	1.06	21.22	39.36	14.16	21.16
Hong Kong	1.76	0.13	1.81	3.71	47.48	3.60	48.93	100.00	1.35	40.46	41.63	22.20	31.56
Taiwan	10.38	0.03	0.31	10.71	96.90	0.25	2.85	100.00	1.30	20.11	29.83	17.97	20.07
Indonesia	110.88	0.02	0.09	110.99	99.91	0.01	0.08	100.00	1.95	1.63	31.52	2.69	1.64
Malaysia	9.96	0.09	1.42	11.47	86.84	0.76	12.40	100.00	2.39	7.48	39.86	7.08	7.67
Philippines	36.69	0.07	0.07	36.83	99.61	0.19	0.20	100.00	2.27	2.02	37.57	4.79	2.09
Singapore	1.21	0.02	1.17	2.39	50.46	0.86	48.68	100.00	2.17	41.41	39.72	18.72	30.35
Thailand	37.36	0.06	0.71	38.14	97.97	0.16	1.87	100.00	1.52	2.81	38.76	3.20	2.87
Vietnam	44.94	0.00	0.08	45.02	99.83	0.01	0.17	100.00	2.32	0.73	38.77	2.35	0.73
Bangladesh	74.58	0.00	0.58	75.17	99.23	0.00	0.77	100.00	2.61	0.53	39.81	1.33	0.53
India	452.59	0.01	3.80	456.41	99.16	0.00	0.83	100.00	2.06	1.17	40.57	1.79	1.18
Pakistan	56.17	0.00	1.74	57.91	97.00	0.00	3.00	100.00	3.80	1.33	36.23	1.47	1.33
Rest of Asia	79.38	0.03	1.23	80.64	98.45	0.03	1.52	100.00	1.82	0.69	38.77	1.53	0.71
Asia	1,782.46	1.01	14.47	1,797.94	99.14	0.06	0.80	100.00	1.51	12.09	38.12	8.49	10.76
Australia-New Zealand	9.15	2.20	1.88	13.23	69.16	16.65	14.20	100.00	1.93	39.19	37.86	26.10	37.11
North America	146.74	6.01	25.95	178.70	82.11	3.37	14.52	100.00	0.97	49.72	46.91	30.69	46.86
Latin America	259.10	1.44	3.00	263.54	98.31	0.55	1.14	100.00	2.31	6.38	37.38	6.31	6.55
European Union (27)	206.00	11.56	20.26	237.83	86.62	4.86	8.52	100.00	0.77	25.78	36.21	23.20	26.07
Former Soviet Union	123.13	0.48	17.42	141.03	87.31	0.34	12.35	100.00	0.90	4.46	27.33	4.93	4.60
Middle East-Northern Africa	134.78	1.09	16.67	152.54	88.36	0.71	10.93	100.00	2.67	4.97	33.11	4.00	5.06
Southern Africa	312.93	0.15	9.87	322.94	96.90	0.05	3.06	100.00	2.91	1.01	32.62	1.84	1.05
Rest of World	19.49	0.95	1.13	21.57	90.35	4.41	5.24	100.00	0.89	19.64	31.83	14.70	19.92
World	2,993.77	24.89	110.65	3,129.31	95.67	0.80	3.54	100.00	1.65	7.51	38.66	14.87	8.01

Source: Author's estimation based on labor force (LABSTA, ILO) and migration database (World Bank, 2011).

Table 4. Changes in Labor Force by Origin

(1) Changes in Number of Labor Force

(1,000 workers)

	Scenario 1: North America				Scenario 2: Middle East/ Northern Africa				Scenario 3: Intra-Asia			
	Native	High-income origin	Low-income origin	Total	Native	High-income origin	Low-income origin	Total	Native	High-income origin	Low-income origin	Total
Japan	-7.50			-7.50	-0.07			-0.07	-1.82	10.96	21.57	30.71
China	-47.08			-47.08	-1.56			-1.56	-97.26	1.34	2.99	-92.94
Korea	-20.13			-20.13	-0.03			-0.03	-12.53	0.45	9.06	-3.03
Hong Kong	-8.74			-8.74	0.00			0.00	-0.49	1.49	52.46	53.47
Taiwan	-8.91			-8.91	0.00			0.00	-0.85	0.57	9.13	8.84
Indonesia	-2.10			-2.10	-7.52			-7.52	-33.78	0.30	2.31	-31.17
Malaysia	-1.66			-1.66	-0.11			-0.11	-23.77	2.05	42.44	20.71
Philippines	-40.62			-40.62	-18.17			-18.17	-14.37	0.24	1.28	-12.85
Singapore	-0.78			-0.78	-0.01			-0.01	-3.30	0.06	34.74	31.51
Thailand	-3.76			-3.76	-0.48			-0.48	-9.18	0.90	19.66	11.38
Vietnam	-27.81			-27.81	0.00			0.00	-7.29	0.04	2.22	-5.03
Bangladesh	-3.86			-3.86	-3.86			-19.02	-76.97	0.01	17.34	-59.62
India	-34.96			-34.96	-75.80			-75.80	-92.53	0.10	113.34	20.90
Pakistan	-9.15			-9.15	-41.61			-41.61	-26.73	0.01	51.98	25.26
Rest of Asia	-22.15			-22.15	-60.53			-60.53	-35.20	0.49	36.57	1.86
Asia	-239.23	0.00	0.00	-239.23	-224.90	0.00	0.00	-224.90	-436.09	19.00	417.09	0.00
Australia-New Zealand												
North America		46.07	193.16	239.23								
Latin America												
European Union (27)												
Former Soviet Union												
Middle East-Northern Africa					0.11	224.79	224.90					
Southern Africa												
Rest of World												
World	-239.23	46.07	193.16	0.00	-224.90	0.11	224.79	0.00	-436.09	19.00	417.09	0.00

(2) Percentage Changes in Labor Force

(percent)

	Scenario 1: North America				Scenario 2: Middle East/ Northern Africa				Scenario 3: Intra-Asia			
	Native	High-income origin	Low-income origin	Total	Native	High-income origin	Low-income origin	Total	Native	High-income origin	Low-income origin	Total
Japan	-0.01			-0.01	0.00			0.00	0.00	2.44	2.08	0.05
China	-0.01			-0.01	0.00			0.00	-0.01	2.24	2.40	-0.01
Korea	-0.08			-0.08	0.00			0.00	-0.05	0.96	2.93	-0.01
Hong Kong	-0.50			-0.24	0.00			0.00	-0.03	1.12	2.89	1.44
Taiwan	-0.09			-0.08	0.00			0.00	-0.01	2.09	2.99	0.08
Indonesia	0.00			0.00	-0.01			-0.01	-0.03	1.85	2.61	-0.03
Malaysia	-0.02			-0.01	0.00			0.00	-0.24	2.36	2.98	0.18
Philippines	-0.11			-0.11	-0.05			-0.05	-0.04	0.34	1.76	-0.03
Singapore	-0.06			-0.03	0.00			0.00	-0.27	0.31	2.98	1.32
Thailand	-0.01			-0.01	0.00			0.00	-0.02	1.48	2.76	0.03
Vietnam	-0.06			-0.06	0.00			0.00	-0.02	1.29	2.95	-0.01
Bangladesh	-0.01			-0.01	-0.03			-0.03	-0.10	0.54	2.99	-0.08
India	-0.01			-0.01	-0.02			-0.02	-0.02	0.82	2.98	0.00
Pakistan	-0.02			-0.02	-0.07			-0.07	-0.05	0.48	2.99	0.04
Rest of Asia	-0.03			-0.03	-0.08			-0.08	-0.04	1.90	2.98	0.00
Asia	-0.01	0.00	0.00	-0.01	-0.01	0.00	0.00	-0.01	-0.02	1.87	2.88	0.00
Australia-New Zealand												
North America	0.00	0.77	0.74	0.13								
Latin America												
European Union (27)												
Former Soviet Union												
Middle East-Northern Africa					0.00	0.01	1.35	0.15				
Southern Africa												
Rest of World												
World	-0.01	0.19	0.17	0.00	-0.01	0.00	0.20	0.00	-0.01	0.08	0.38	0.00

Source: Author's estimation based on labor force (LABSTA, ILO) and migration database (World Bank, 2011).

Table 5. Impact on Macroeconomic Variables and Labor Market

	Percentage Changes (percent)					Changes in Quantity (\$billion)				
	GDP	Output	Composite	Exports	Imports	GDP	Output	Composite	Exports	Imports
<i>SIM-1: North America</i>										
Japan	0.786	0.826	0.809	0.873	0.726	34.42	69.89	69.21	5.86	3.97
China	0.476	0.507	0.510	0.559	0.611	16.62	49.17	49.02	6.07	5.10
Korea	1.344	1.370	1.300	1.265	1.105	14.10	31.70	31.60	4.61	3.50
Hong Kong	1.567	1.514	1.366	1.099	1.127	3.25	6.70	5.91	0.40	1.07
Taiwan	2.342	2.433	2.327	2.224	2.089	9.20	21.79	20.08	5.75	4.08
Indonesia	0.060	0.060	0.075	0.154	0.294	0.26	0.50	0.62	0.18	0.25
Malaysia	0.094	0.110	0.133	0.194	0.265	0.18	0.56	0.63	0.33	0.33
Philippines	0.916	0.921	0.882	1.060	0.978	1.37	2.64	2.50	0.68	0.57
Singapore	0.318	0.330	0.326	0.403	0.398	0.53	1.40	1.33	0.60	0.51
Thailand	0.448	0.465	0.458	0.486	0.524	1.11	2.45	2.33	0.73	0.63
Vietnam	1.024	1.038	0.891	0.925	0.853	0.73	0.98	1.01	0.45	0.46
Bangladesh	0.094	0.084	0.102	0.032	0.159	0.06	0.09	0.12	0.00	0.03
India	0.415	0.441	0.423	0.399	0.330	5.16	10.43	10.47	0.58	0.74
Pakistan	0.200	0.199	0.201	0.145	0.227	0.29	0.53	0.59	0.02	0.07
Rest of Asia	0.358	0.356	0.355	0.306	0.411	0.37	0.63	0.66	0.10	0.16
Asia	0.711	0.728	0.711	0.792	0.748	87.64	199.45	196.08	26.37	21.47
Australia-New Zealand	-0.096	-0.103	-0.081	0.049	0.175	-0.95	-1.94	-1.58	0.07	0.26
North America	0.061	0.068	0.075	0.108	0.170	9.43	18.35	21.48	0.98	2.81
Latin America	-0.108	-0.115	-0.109	-0.024	0.015	-4.04	-7.36	-7.01	-0.14	0.07
European Union (27)	-0.149	-0.157	-0.144	-0.134	0.022	-25.24	-49.63	-47.13	-2.04	0.36
Former Soviet Union	-0.096	-0.104	-0.103	-0.028	-0.046	-1.62	-3.43	-3.35	-0.10	-0.13
Middle East-Northern Africa	-0.093	-0.102	-0.080	0.039	0.120	-2.44	-4.48	-3.48	0.32	0.72
Southern Africa	-0.092	-0.110	-0.094	-0.023	0.039	-0.81	-1.77	-1.55	-0.05	0.07
Rest of World	-0.121	-0.129	-0.128	-0.128	-0.153	-1.25	-2.45	-2.44	-0.42	-0.48
World	0.109	0.139	0.139	0.304	0.306	60.72	146.73	151.03	25.08	25.08
<i>SIM-2: Middle East and Northern Africa</i>										
Japan	-0.009	-0.009	-0.009	-0.005	-0.004	-0.40	-0.78	-0.78	-0.03	-0.02
China	-0.003	-0.002	-0.003	0.008	-0.002	-0.10	-0.15	-0.25	0.09	-0.02
Korea	-0.020	-0.020	-0.019	-0.015	-0.012	-0.21	-0.47	-0.45	-0.05	-0.04
Hong Kong	-0.024	-0.023	-0.020	-0.005	-0.013	-0.05	-0.10	-0.09	0.00	-0.01
Taiwan	-0.022	-0.021	-0.022	-0.011	-0.020	-0.09	-0.18	-0.19	-0.03	-0.04
Indonesia	0.211	0.228	0.224	0.172	0.170	0.91	1.91	1.84	0.21	0.14
Malaysia	-0.010	-0.007	-0.008	0.007	0.001	-0.02	-0.04	-0.04	0.01	0.00
Philippines	0.266	0.264	0.241	0.282	0.221	0.40	0.76	0.68	0.18	0.13
Singapore	-0.021	-0.007	-0.004	0.032	0.017	-0.03	-0.03	-0.02	0.05	0.02
Thailand	0.025	0.027	0.026	0.035	0.033	0.06	0.14	0.13	0.05	0.04
Vietnam	-0.012	-0.012	0.000	-0.015	0.002	-0.01	-0.01	0.00	-0.01	0.00
Bangladesh	0.358	0.361	0.331	0.381	0.249	0.25	0.39	0.38	0.05	0.04
India	0.573	0.613	0.575	0.567	0.388	7.12	14.49	14.25	0.82	0.87
Pakistan	0.668	0.710	0.636	0.843	0.422	0.96	1.91	1.87	0.14	0.14
Rest of Asia	0.655	0.646	0.581	0.391	0.508	0.67	1.14	1.08	0.13	0.20
Asia	0.077	0.069	0.067	0.048	0.050	9.46	18.96	18.41	1.61	1.45
Australia-New Zealand	-0.022	-0.023	-0.021	-0.009	-0.004	-0.22	-0.44	-0.42	-0.01	-0.01
North America	-0.024	-0.025	-0.021	-0.036	0.005	-3.64	-6.63	-6.06	-0.33	0.08
Latin America	-0.018	-0.019	-0.019	-0.011	-0.023	-0.67	-1.19	-1.23	-0.07	-0.11
European Union (27)	-0.023	-0.024	-0.022	-0.015	-0.002	-3.87	-7.50	-7.09	-0.23	-0.03
Former Soviet Union	-0.024	-0.024	-0.025	-0.010	-0.026	-0.40	-0.81	-0.82	-0.04	-0.07
Middle East-Northern Africa	0.062	0.067	0.060	0.065	0.034	1.63	2.96	2.62	0.53	0.20
Southern Africa	-0.019	-0.022	-0.019	-0.001	0.011	-0.17	-0.35	-0.31	0.00	0.02
Rest of World	-0.020	-0.021	-0.021	-0.014	-0.024	-0.21	-0.39	-0.39	-0.05	-0.07
World	0.003	0.004	0.004	0.017	0.018	1.91	4.61	4.71	1.44	1.44

(continued on Table 5)

	Percentage Changes (percent)					Changes in Quantity (\$billion)				
	GDP	Output	Composite	Exports	Imports	GDP	Output	Composite	Exports	Imports
<i>SIM-3: Intra-Asia</i>										
Japan	0.216	0.229	0.228	0.303	0.301	9.47	19.35	19.52	2.03	1.65
China	0.740	0.787	0.776	0.683	0.609	25.87	76.37	74.54	7.42	5.09
Korea	0.768	0.793	0.757	0.770	0.650	8.06	18.36	18.41	2.80	2.06
Hong Kong	1.475	1.459	1.333	1.339	0.961	3.05	6.45	5.77	0.49	0.91
Taiwan	0.312	0.350	0.351	0.408	0.428	1.23	3.13	3.02	1.06	0.84
Indonesia	1.240	1.336	1.331	1.077	1.226	5.36	11.21	10.93	1.29	1.04
Malaysia	1.524	1.485	1.455	1.347	1.448	2.85	7.59	6.85	2.32	1.78
Philippines	0.253	0.274	0.282	0.421	0.445	0.38	0.79	0.80	0.27	0.26
Singapore	2.084	1.835	1.664	1.522	1.596	3.51	7.77	6.81	2.26	2.06
Thailand	0.886	0.901	0.868	0.861	0.879	2.19	4.75	4.42	1.30	1.06
Vietnam	0.237	0.245	0.288	0.213	0.301	0.17	0.23	0.33	0.10	0.16
Bangladesh	1.129	1.142	1.044	1.192	0.769	0.77	1.22	1.19	0.15	0.12
India	0.616	0.665	0.630	0.685	0.461	7.66	15.72	15.61	0.99	1.03
Pakistan	0.439	0.465	0.423	0.593	0.310	0.63	1.25	1.24	0.10	0.10
Rest of Asia	0.450	0.452	0.439	0.422	0.491	0.46	0.80	0.81	0.14	0.19
Asia	0.581	0.638	0.618	0.683	0.639	71.64	174.98	170.26	22.72	18.35
Australia-New Zealand	-0.093	-0.098	-0.080	0.029	0.137	-0.93	-1.85	-1.56	0.04	0.20
North America	-0.107	-0.112	-0.094	-0.106	0.108	-16.54	-30.15	-26.94	-0.96	1.79
Latin America	-0.078	-0.084	-0.081	-0.038	-0.037	-2.92	-5.37	-5.25	-0.23	-0.18
European Union (27)	-0.102	-0.107	-0.097	-0.076	0.030	-17.26	-33.79	-31.74	-1.15	0.51
Former Soviet Union	-0.069	-0.075	-0.073	-0.014	-0.016	-1.17	-2.48	-2.37	-0.05	-0.04
Middle East-Northern Africa	-0.065	-0.071	-0.055	0.028	0.090	-1.70	-3.13	-2.39	0.23	0.54
Southern Africa	-0.062	-0.076	-0.061	0.002	0.069	-0.54	-1.23	-1.00	0.00	0.13
Rest of World	-0.084	-0.089	-0.088	-0.084	-0.109	-0.87	-1.69	-1.68	-0.28	-0.34
World	0.053	0.090	0.090	0.247	0.255	29.72	95.30	97.33	20.34	20.97

Source: Author's model estimations.

Note: Quotations are in quantity, except for GDP.

Table 6. Changes in Out-migrant and Immigrant Labor Force in Scenario 3

(1,000 workers)

	Changes in Labor Force at Home				Changes in Out-migrant Labor Force		
	Native	High-income origin	Low-income origin	Total	High-income origin	Low-income origin	Total
Japan	-1.82	10.96	21.57	30.71	0.58	1.24	1.82
China	-97.26	1.34	2.99	-92.94	76.10	21.17	97.26
Korea	-12.53	0.45	9.06	-3.03	11.27	1.26	12.53
Hong Kong	-0.49	1.49	52.46	53.47	0.05	0.44	0.49
Taiwan	-0.85	0.57	9.13	8.84	0.20	0.65	0.85
Indonesia	-33.78	0.30	2.31	-31.17	4.85	28.93	33.78
Malaysia	-23.77	2.05	42.44	20.71	21.33	2.44	23.77
Philippines	-14.37	0.24	1.28	-12.85	7.85	6.52	14.37
Singapore	-3.30	0.06	34.74	31.51	1.43	1.87	3.30
Thailand	-9.18	0.90	19.66	11.38	4.69	4.50	9.18
Vietnam	-7.29	0.04	2.22	-5.03	2.55	4.75	7.29
Bangladesh	-76.97	0.01	17.34	-59.62	0.76	76.21	76.97
India	-92.53	0.10	113.34	20.90	4.54	88.00	92.53
Pakistan	-26.73	0.01	51.98	25.26	1.31	25.42	26.73
Rest of Asia	-35.20	0.49	36.57	1.86	3.00	32.20	35.20
Asia	-436.09	19.00	417.09	0.00	140.50	295.59	436.09
Australia-New Zealand							
North America							
Latin America							
European Union (27)							
Former Soviet Union							
Middle East-Northern Africa							
Southern Africa							
Rest of World							
World	-436.09	19.00	417.09	0.00	140.50	295.59	436.09

Source: Author's model estimations.

Table 7. Impact on Wages and Other Factor Remunerations in Scenario 3

	Wages (Labor)				Rent		
	Native	High-income origin	Low-income origin	Total	Capital	Land	Natural Resources
Japan	0.205	-0.660	-0.507	0.181	0.198	0.282	0.335
China	0.624	-0.282	-0.357	0.626	0.625	0.953	1.224
Korea	0.724	1.008	0.244	0.710	0.726	0.744	0.981
Hong Kong	0.267	0.140	-0.829	-0.528	1.156	0.795	1.784
Taiwan	0.266	0.403	-0.052	0.251	0.248	0.275	0.433
Indonesia	1.244	0.894	0.538	1.194	1.104	1.455	1.548
Malaysia	0.867	0.447	0.171	0.820	1.369	1.716	1.886
Philippines	0.272	0.322	-0.245	0.277	0.256	0.305	0.326
Singapore	0.732	1.315	0.264	-0.011	2.001	1.763	1.490
Thailand	0.678	0.705	0.150	0.683	0.792	0.855	1.139
Vietnam	0.312	0.640	-0.348	0.326	0.271	0.310	0.491
Bangladesh	0.970	1.391	0.314	0.916	1.269	1.369	1.481
India	0.534	1.114	0.096	0.531	0.509	0.580	0.922
Pakistan	0.341	1.132	-0.102	0.325	0.372	0.400	0.569
Rest of Asia	0.301	0.452	-0.107	0.363	0.411	0.502	0.730
Asia	0.441	-0.108	-0.434	0.467	0.474	0.829	1.190
Australia-New Zealand	-0.086	-0.087	-0.086	-0.086	-0.056	0.004	0.040
North America	-0.099	-0.099	-0.099	-0.099	-0.097	-0.063	-0.161
Latin America	-0.073	-0.074	-0.073	-0.073	-0.076	-0.030	-0.016
European Union (27)	-0.094	-0.094	-0.094	-0.094	-0.090	-0.099	-0.108
Former Soviet Union	-0.065	-0.066	-0.066	-0.065	-0.053	-0.026	-0.056
Middle East-Northern Africa	-0.061	-0.066	-0.061	-0.062	-0.037	-0.078	0.135
Southern Africa	-0.050	-0.054	-0.051	-0.050	-0.038	-0.022	0.083
Rest of World	-0.085	-0.086	-0.085	-0.085	-0.073	-0.020	-0.043
World	0.058	-0.090	-0.278	0.045	0.049	0.430	0.304

Source: Author's model estimations..

Table 8. Changes in Factor Income in Scenario 3

	Changes in Factor Income (percent)								Changes in Factor Income (\$billion)							
	Labor				Capital	Land	Natural Resources	Total	Labor				Capital	Land	Natural Resources	Total
	Native	High-income origin	Low-income origin	Sub-total					Native	High-income origin	Low-income origin	Sub-total				
Japan	0.201	1.769	1.566	0.227	0.198	0.282	0.335	0.217	4.967	0.328	0.415	5.709	2.876	0.020	0.014	8.620
China	0.611	1.947	2.033	0.614	0.625	0.953	1.224	0.652	8.975	0.044	0.006	9.026	8.928	1.076	1.319	20.349
Korea	0.671	1.975	3.179	0.697	0.726	0.744	0.981	0.710	3.380	0.036	0.139	3.555	2.682	0.083	0.015	6.335
Hong Kong	0.239	1.259	2.039	0.907	1.156	0.795	1.784	1.016	0.170	0.070	0.821	1.061	0.976	0.004	0.023	2.065
Taiwan	0.257	2.506	2.941	0.334	0.248	0.275	0.433	0.300	0.537	0.020	0.161	0.718	0.351	0.006	0.003	1.078
Indonesia	1.158	2.759	3.174	1.165	1.104	1.455	1.548	1.170	2.097	0.014	0.008	2.119	2.057	0.286	0.311	4.773
Malaysia	0.626	2.816	3.158	1.002	1.369	1.716	1.886	1.217	0.466	0.098	0.318	0.882	1.057	0.072	0.143	2.154
Philippines	0.222	0.665	1.514	0.243	0.256	0.305	0.326	0.252	0.164	0.017	0.005	0.187	0.145	0.016	0.010	0.357
Singapore	0.442	1.632	3.272	1.305	2.001	1.763	1.490	1.661	0.221	0.013	0.714	0.948	1.520	0.002	0.001	2.471
Thailand	0.632	2.196	2.931	0.713	0.792	0.855	1.139	0.761	0.663	0.052	0.067	0.781	0.834	0.037	0.045	1.698
Vietnam	0.296	1.939	2.589	0.314	0.271	0.310	0.491	0.307	0.097	0.002	0.005	0.104	0.055	0.002	0.013	0.174
Bangladesh	0.786	1.944	3.324	0.836	1.269	1.369	1.481	1.007	0.309	0.001	0.026	0.335	0.229	0.039	0.036	0.638
India	0.502	1.949	3.081	0.536	0.509	0.580	0.922	0.533	2.666	0.009	0.210	2.885	2.503	0.422	0.167	5.976
Pakistan	0.280	1.619	2.921	0.369	0.372	0.400	0.569	0.375	0.209	0.002	0.075	0.285	0.156	0.033	0.012	0.486
Rest of Asia	0.242	2.351	2.894	0.365	0.411	0.502	0.730	0.402	0.132	0.023	0.054	0.209	0.092	0.016	0.035	0.353
Asia	0.422	1.802	2.441	0.472	0.535	0.829	1.190	0.518	25.050	0.730	3.024	28.804	24.461	2.115	2.147	57.528
Australia-New Zealand	-0.086	-0.087	-0.086	-0.086	-0.056	0.004	0.040	-0.072	-0.307	-0.072	-0.042	-0.421	-0.187	0.000	0.005	-0.603
North America	-0.099	-0.099	-0.099	-0.099	-0.097	-0.063	-0.161	-0.098	-7.201	-0.278	-0.786	-8.266	-4.229	-0.024	-0.125	-12.644
Latin America	-0.073	-0.074	-0.073	-0.073	-0.076	-0.030	-0.016	-0.072	-1.200	-0.040	-0.014	-1.254	-1.011	-0.013	-0.010	-2.288
European Union (27)	-0.094	-0.094	-0.094	-0.094	-0.090	-0.099	-0.108	-0.092	-4.976	-0.393	-0.440	-5.809	-6.891	-0.058	-0.044	-12.802
Former Soviet Union	-0.064	-0.066	-0.065	-0.065	-0.053	-0.026	-0.056	-0.058	-0.354	-0.009	-0.056	-0.419	-0.381	-0.006	-0.052	-0.858
Middle East-Northern Africa	-0.061	-0.066	-0.061	-0.062	-0.037	-0.078	0.135	-0.031	-0.412	-0.024	-0.040	-0.476	-0.519	-0.010	0.265	-0.741
Southern Africa	-0.050	-0.054	-0.051	-0.050	-0.038	-0.022	0.083	-0.036	-0.158	-0.003	-0.009	-0.170	-0.148	-0.003	0.035	-0.286
Rest of World	-0.085	-0.086	-0.085	-0.085	-0.073	-0.020	-0.043	-0.078	-0.327	-0.026	-0.014	-0.367	-0.267	-0.002	-0.010	-0.647
World	0.045	-0.012	0.098	0.046	0.051	0.430	0.304	0.056	10.115	-0.114	1.621	11.622	10.829	1.998	2.211	26.661

Source: Author's model estimations.

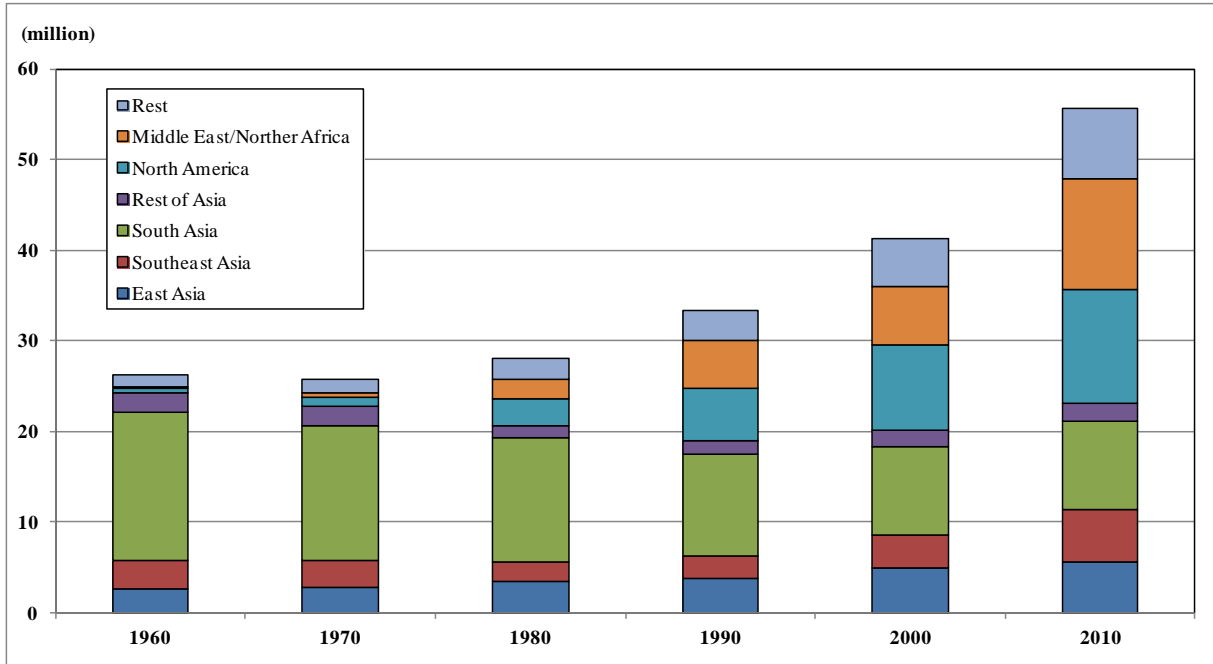
Table 9. Changes in Household Income

(Billion)

	Native Households					Migrant Households			Total	Percentage Change (%)			Total
	Labor	Capital	Land	Remittances	Sub-total	High-income origin	Low-income origin	Sub-total		Native	High-income origin	Low-income origin	
Japan	4.97	0.77	0.02	0.01	5.77	0.33	0.41	0.74	6.51	0.16	1.18	1.04	0.18
China	8.98	1.29	0.00	0.40	10.67	0.04	0.01	0.05	10.72	0.49	1.95	2.03	0.49
Korea	3.38	0.20	0.08	0.05	3.71	0.04	0.14	0.18	3.89	0.50	1.86	3.09	0.52
Hong Kong	0.17	0.15	0.00	0.00	0.32	0.07	0.82	0.89	1.21	0.21	1.18	1.90	0.59
Taiwan	0.54	0.05	0.01	0.00	0.60	0.02	0.16	0.18	0.78	0.16	1.95	2.35	0.20
Indonesia	2.10	0.31	0.29	0.13	2.82	0.01	0.01	0.02	2.84	0.72	2.76	3.17	0.72
Malaysia	0.47	0.16	0.07	0.03	0.73	0.10	0.32	0.42	1.14	0.50	2.82	3.16	0.73
Philippines	0.16	0.02	0.02	0.05	0.25	0.02	0.01	0.02	0.27	0.16	0.66	1.51	0.17
Singapore	0.22	0.57	0.00	0.01	0.80	0.01	0.71	0.73	1.53	0.60	1.31	2.62	0.94
Thailand	0.66	0.13	0.04	0.02	0.84	0.05	0.07	0.12	0.96	0.43	2.20	2.93	0.48
Vietnam	0.10	0.02	0.00	0.01	0.13	0.00	0.00	0.01	0.14	0.19	1.94	2.59	0.20
Bangladesh	0.31	0.07	0.04	0.11	0.52	0.00	0.03	0.03	0.55	0.68	1.94	3.32	0.71
India	2.67	0.38	0.42	0.18	3.65	0.01	0.21	0.22	3.87	0.34	1.95	3.08	0.35
Pakistan	0.21	0.05	0.03	0.03	0.31	0.00	0.07	0.08	0.39	0.18	1.62	2.92	0.22
Rest of Asia	0.13	0.01	0.02	0.02	0.18	0.02	0.05	0.08	0.26	0.23	2.35	2.89	0.31
Asia	25.05	4.18	1.04	1.04	31.30	0.73	3.02	3.75	35.05	0.33	1.44	2.06	0.36
Australia-New Zealand	-0.31	-0.04	0.00	-0.01	-0.35	-0.07	-0.04	-0.11	-0.47	-0.05	-0.07	-0.07	-0.05
North America	-7.20	-2.92	-0.02	-0.01	-10.15	-0.28	-0.79	-1.06	-11.21	-0.08	-0.09	-0.09	-0.08
Latin America	-1.20	-0.30	-0.01	-0.05	-1.56	-0.04	-0.01	-0.05	-1.62	-0.05	-0.07	-0.07	-0.05
European Union (27)	-4.98	-3.10	-0.06	-0.07	-8.21	-0.39	-0.44	-0.83	-9.04	-0.07	-0.09	-0.09	-0.07
Former Soviet Union	-0.35	-0.21	-0.01	-0.01	-0.59	-0.01	-0.06	-0.06	-0.65	-0.05	-0.07	-0.07	-0.05
Middle East-Northern Africa	-0.41	-0.27	-0.01	-0.04	-0.73	-0.02	-0.04	-0.06	-0.80	-0.04	-0.07	-0.06	-0.04
Southern Africa	-0.16	-0.06	0.00	-0.01	-0.24	0.00	-0.01	-0.01	-0.25	-0.03	-0.05	-0.05	-0.03
Rest of World	-0.33	-0.04	0.00	-0.01	-0.38	-0.03	-0.01	-0.04	-0.42	-0.05	-0.09	-0.09	-0.05
World	10.11	-2.78	0.92	0.83	9.09	-0.11	1.62	1.51	10.60	0.02	-0.01	0.09	0.02

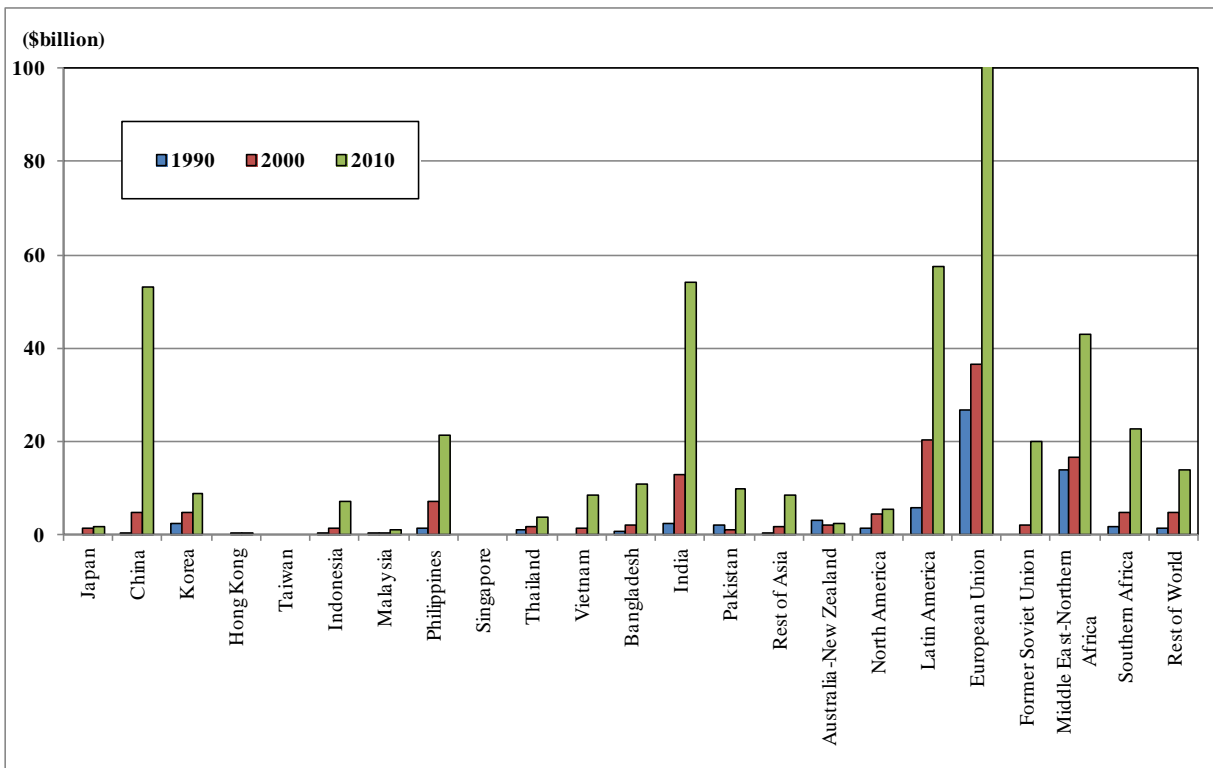
Source: Author's model estimations.

Figure 1. Asia's Migration Stock by Destination: 1960-2010



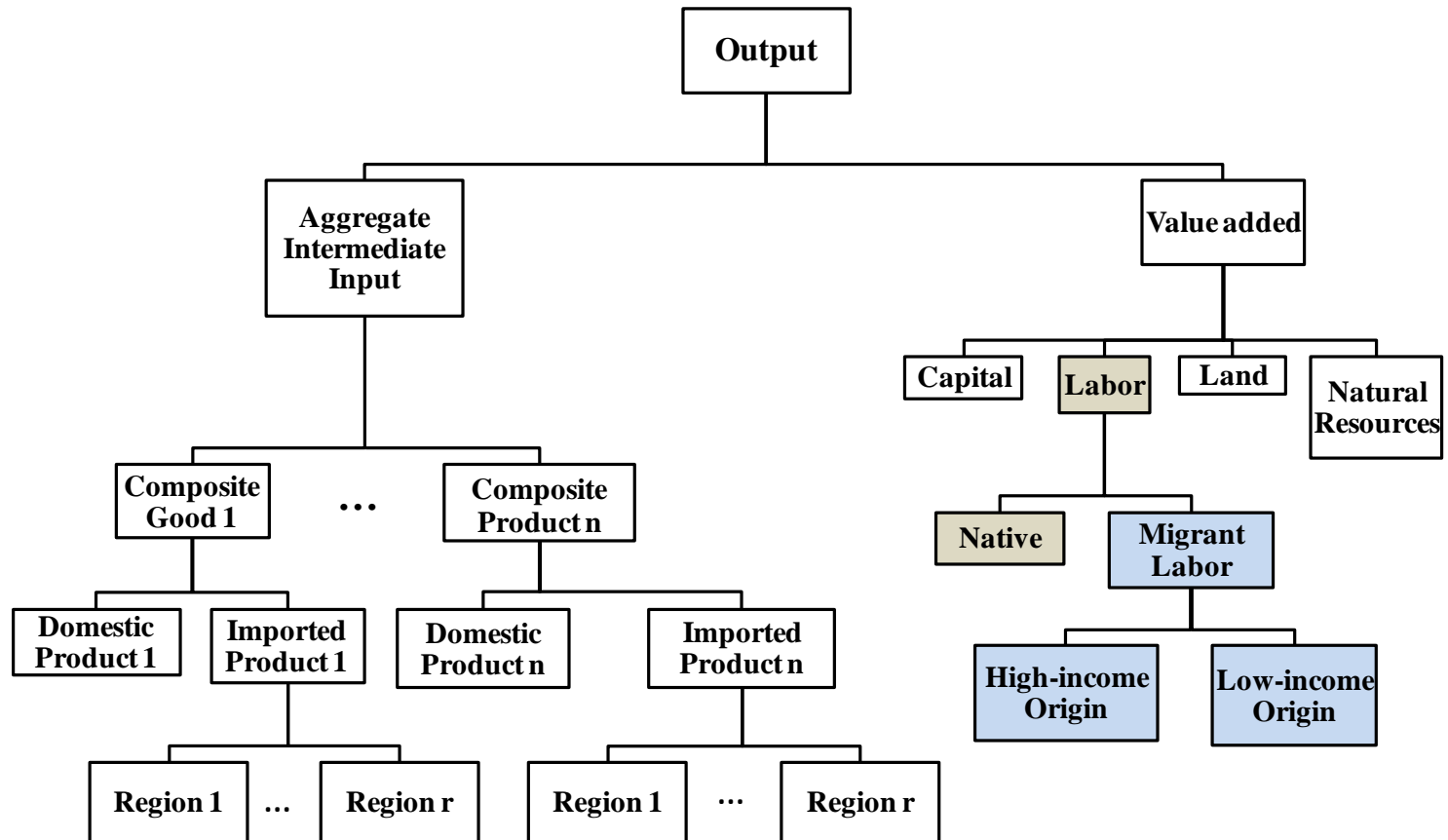
Source: World Bank (2011).

Figure 2. Remittance Flows: 1990-2010



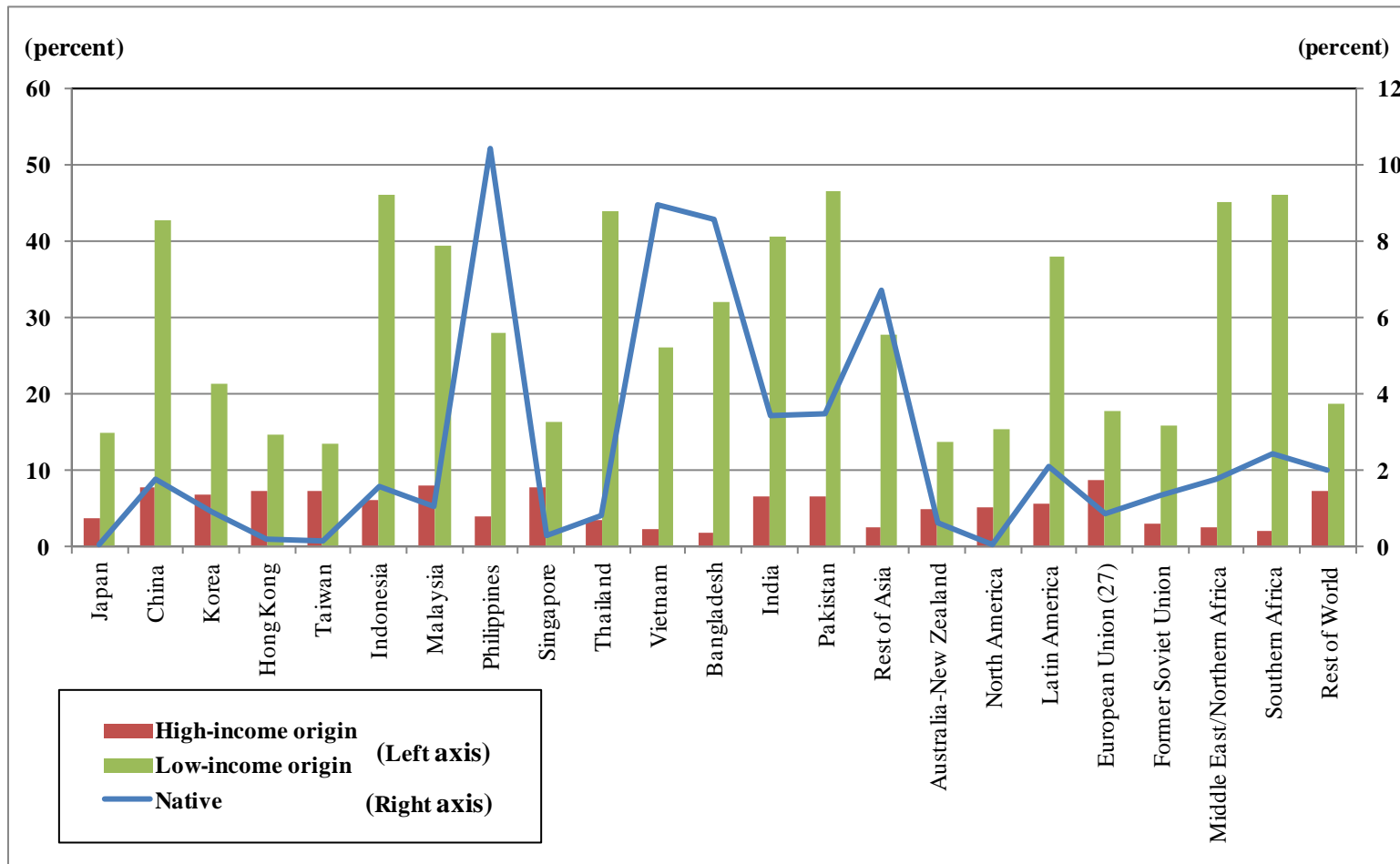
Source: World Bank (2011).

Figure 3. Nested Production Structure incorporating International Migration



Source: Model structure for this study.

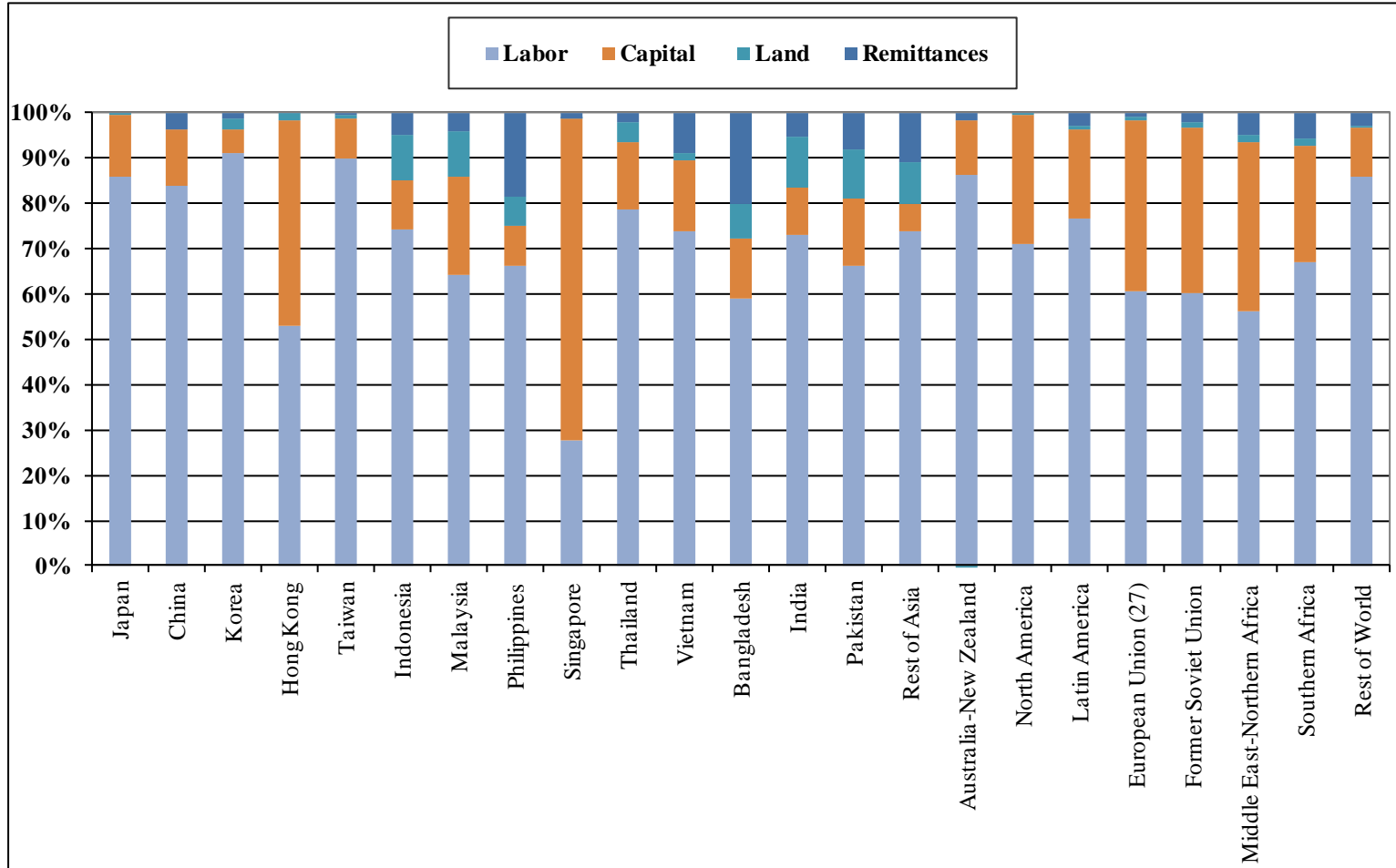
Figure 4. Share of Remittances in Household Income (2007)



Source: SAM model database.

Note: Solid bars show the ratios of remittances in migrants' household income in host destinations, whereas lines depict the share of remittances in aggregate household income at home.

Figure 5. Composition of New Household Income by Component for Native Households



Source: Author's model estimations.