Labor Migration and Economic Growth in East and Southeast Asia

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Abstract

East and Southeast Asia face major demographic changes over the next few decades as many countries' labor forces will start to decline, while others will experience higher labor force growth as populations and participation rates increase. A well-managed labor migration strategy presents itself as a mechanism for ameliorating the impending labor shortages in some East-Asia Pacific countries, while providing an opportunity for other countries with excess labor to provide migrant workers that will contribute to the development of the home country through greater remittance flows. Although

migration would be unable to offset the economic impacts of the declining labor forces in the countries with shrinking populations, a more flexible migration policy, allowing migrants to respond to the major demographic changes occurring in Asia over the next 50 years, would be beneficial to most economies in the region in terms of real incomes and real gross domestic product over the 2007–2050 period. Such a policy could deeply affect the net migration position of a country. Countries that were net recipients under current migration policies might become net senders under the more liberal policy regime.

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1. Introduction

The East Asia and Pacific (EAP) region experienced sharp demographic changes between 1965 and 1990, with the declining mortality and fertility rates contributing to the rapid economic growth of those times (Bloom and Williamson, 1998). While these rapid demographic changes are projected to persist in the future, their impacts will not be as generally positive as they have been historically. The changing demographics of Asian countries will create labor shortages in some countries, while other Asian countries will experience large expansions in their labor force, with substantial economic impacts in all countries. Japan will soon have declining economic growth rates, eventually reaching near-zero economic growth in the 2040s (Komine and Kabe, 2009). China; Hong Kong SAR, China; Singapore; and South Korea are now experiencing declining total fertility rates and will soon have aging populations. Their growth rates will continue at annual rates of 3 to 5 percent until 2020, after which growth will decelerate.

A well-managed labor migration strategy within the region thus has the potential to ameliorate impending labor shortages in some EAP countries, while providing an opportunity for countries with excess labor to provide migrant workers that will contribute to the development of the home country through greater remittance flows.

This study thus examines the potential impact of increased migration on the East and Southeast Asian economies, in light of these projected demographic changes. These potential impacts are analyzed using a global dynamic simulation model, with migrant labor flows and remittances used to examine the impact of migration. The nature of both demographic changes and migration for individual countries and its effect on other countries justifies the use of a global dynamic economic simulation framework that can account for the factor and price changes that will arise from the substantial labor force changes induced by demographic transition and migration.

2. Literature Review

There is a large and growing economic literature on migration and its impacts, going back to Samuelson's (1964) discussion of the implications of immigration into the USA on labor supply and wages. This section will review a few broad segments of the literature. This will allow for a thorough understanding of the mechanisms by which migration might affect labor receiving countries and to better understand the Asian context within which the mechanisms will be considered in this study.

2.1 Drivers of Migration

Contemporary theories of international migration across all disciplines (see Massey et al., 1998) suggest that people move because of expected improvements elsewhere, where improvements might include higher wages, employment, health, and education. From an economic perspective, migration occurs because of spatial differences in the supply and demand of labor. This is the basis of the Harris – Todaro model of rural-urban migration that explains the migration decision as being based on expected income differentials between rural and urban areas (Harris and Todaro, 1970). In this model, migration from rural areas to urban areas occurs if the rural wage rate (i.e. the rural marginal productivity of labor, MPL) is less than the urban wage rate (i.e. urban MPL) times the urban employed-labor force ratio (i.e. ratio of total employed to total employed plus seeking jobs in the urban area). Conversely, migration from urban areas to rural areas occurs if the urban wage rate is more than the rural wage rate times the urban employed-labor force ratio.

The applicability of this theoretical framework beyond urban-rural migration is supported by broader empirical analyses of migration. For example, Pissarides and McMaster (1990) found that inter-regional migration within the UK responds to changes in regional relative wages and to differences in employment opportunities. In the context of international migration, Hanson and Spilimbergo (1999) explain that high wage differentials between the USA and Mexico have traditionally been the cause of northern migration. However, they also note that the surge of undocumented migration from Mexico during the 1980s is mainly the

result of the increase in the relative size of Mexico's working age population and the greater volatility of Mexican wages relative to the USA.

Demographic factors can also represent another economic force. If there is an excess supply of labor (relative to domestic demand and employment opportunities) in an origin country, then there is an incentive for those workers to move to markets where there is an excess demand. Authukorala's (2006) review of East Asian migration provides several examples of this in the context of undocumented migrant workers from high-population countries travelling to Thailand during periods of economic expansion in the latter, when demand for labor was high.

2.2 Economic Impacts of Demographic Change

Most analyses of the coming changes in Asian labor forces due to demographic changes focus on the economic and socio-political implications of an aging population, such as financing and provision of social services (Nizamuddin, 2003; Ogawa, 2003), changing inequality (Inoguchi, 2009), and international relations (Abidin and Wong, 2009; Ezrati, 1997; Haas, 2007). The labor forces of China, South Korea and Singapore will begin shrinking between 2020 and 2025, with the growth of many ASEAN labor forces also starting to decelerate (JCER, 2007). This is especially disturbing in light of what is known about the contribution of favorable demographic changes to the high East Asian growth rates observed in the 1965-1990 period.

A seminal study by Bloom and Williamson (1998) found that rising working-age shares in the population – and rising labor forces – increased per capita income while holding output per worker constant. Updating the findings of Bloom et al. (2000) to the period 1960-2005, Bloom and Finlay (2009) find that the working age share and labor force growth rates remain important contributors to Asian growth. Columns I and II of Table 1 demonstrate the importance of these two population variables for growth. In the case of Singapore, for example, the labor force growth rate contributed to 2.21 percent of average economic growth between 1965 and 2005, with the growth of the working-age share of the population contributing to more than half of average growth in the period. However, when the study applies projected

growth of the working age shares and population to determine their contribution to future economic growth, it is found that with the exception of Malaysia and the Philippines, the growth rates of all East and Southeast Asian countries become negative as a result of the demographic changes (column III, Table 1).

Table 1: Contribution of Demographic Change to Average Economic Growth (Percentage Points)

Contribution to Economic Growth from Growth of			
	Labor Force and Population (1965-2005)	Working-Age Share and Population (1965-2005)	Working-Age Share and Population (2005-2050)
	I	II	III
China	0.91	16.46	-0.36
Japan	0.35	9.53	-0.91
South Korea	2.01	36.4	-0.87
Singapore	2.21	51.13	-0.78
Southeast Asia			
Indonesia	1.19	41.01	-0.05
Malaysia	1.12	26.71	0.13
Philippines	0.53	36.18	0.46
Thailand	0.88	20.81	-0.45
Bangladesh	0.15	9.53	0.42
India	0.01	0.27	0.36
Nepal	-0.63	-50.32	0.66
Pakistan	-0.10	-3.90	0.73
Sri Lanka	1.15	32.3	-0.26

Source: Reproduced from Bloom and Finlay (2009)

Policies targeting the changes to the labor force that have been considered include such measures as increasing the retirement age of workers as well as encouraging higher fertility rates (Bloom et al., 2007; Watanabe and Fujimoto, 2008). However, the impact of the latter approach is ambiguous, since policies to increase higher fertility rates may dampen female labor force participation, reducing the labor force in the short run (Bloom and Finlay, 2009). Inoguchi (2009) cites evidence from South Korea, where social policy emphasizing traditional family values - to promote a society with higher fertility - accelerated out-migration of specific groups of women.

Given the potentially large differences in labor force growth rates between countries in East and Southeast Asia, the migration of workers into countries that will soon experience declining labor forces from countries with rapidly expanding labor forces presents itself as a potential response to the coming demographic transitions. Surprisingly there has been little policy discussion in East and Southeast Asia about migration as a response to demographic changes and potential labor shortages.² There have also been few studies examining the potential impacts of a migration policy that allows for movements of labor between Asian countries experiencing, or soon to experience, differences in labor demand and supply.

Tyers and Shi (2007) explore the impact of such a policy, projecting substantial aging of labor forces in all regions of the world up to 2035, and declines in labor forces in Western and Central Europe, the former Soviet Union and Japan. They simulate a policy scenario where Western Europe, North America, and Australia respond to declining labor forces by allowing for sufficient migration from the rest of the world to hold non-working age dependency ratios constant from 2000 onwards. They find that even though labor receiving countries are able to maintain high growth rates, the rest of the world experiences substantial welfare losses.

Despite the detrimental effects of the simulated “replacement migration” strategy of developed countries simulated by Tyers and Shi (2007), there is a substantial literature that has examined the benefits of alternative migration policies. Back-of-the-envelope estimates from Rodrik (2004) and Winters (2001) indicate that even modest liberalization of temporary migration from the developing to developed economies can lead to substantial global welfare gains. Hanson’s (2008) review of empirical analyses of the impacts of migration suggests that ignoring large unmeasured negative externalities or unless there are pre-existing distortions to the economy that migration interacts with, international migration liberalization is generally beneficial to expanding global output. The review also finds that international migration undoubtedly has wage impacts on the receiving countries, although changes in non-labor incomes in the labor-receiving country are not well-captured by many statistical analyses. The

² An exception is that of Japanese immigration reform allowing Nikkeijin (migrants with Japanese ancestry, primarily from Latin America) to live and work in Japan.

review suggests that this shortcoming is best addressed through global general equilibrium (GE) analyses.

Computable GE simulations by the World Bank (2006), and Walmsley et al. (2009), predict that greater liberalization of labor movement from the South to the North would lead to global welfare increases. In these studies, the migrant-sending, less developed countries receive large shares of the welfare gains. Walmsley's and Ahmed's (2008) CGE analysis examined multiple counterfactual scenarios where both traditional migration destinations, as well as developed East Asia countries liberalize their migration policies. The study found that regional liberalization seemed to have more positive effects (or less negative effects in the short run) on East and Southeast Asian labor-sending economies. Intraregional policies can thus offer an important mechanism by which Asian economies can reap some of the gains from liberalizing migration; particularly given the reluctance of Europe and traditional migration destinations to open their borders.

2.3 Migration and Migration Policy in Asia

Due to the potential challenges and opportunities presented by international labor movements, historical migration and migration policy have come under great scrutiny by policy makers. Manning and Sidorenko (2007) point out that intra-regional liberalization of skilled worker migration would address the growing phenomena of skill shortages and surpluses in the same occupations across Asian countries, such as seen among ASEAN member states. The study cites Singapore as an example, where there has been growing excess demand for healthcare professionals, managers, accountants, and engineers. At the same time, there is evidence that neighboring Indonesia and the Philippines have surpluses in several of these professions. A policy framework that encourages intra-regional migration could have tremendous potential welfare gains for all countries concerned.

The literature has thus exploded with a plethora of reviews and surveys of the history of East and Southeast Asian migration and migration policy.³ These studies delineate a region that has a long history and culture of migration, predating the colonial era. At the same time, they describe a region whose countries have a great deal of heterogeneity in the levels of formality and structure in migration management policies.

Net migration – i.e. the difference between migrants entering a country and migrants leaving a country – within the EAP region has generally increased over time (Table 2). Korea is the most notable exception, with a general fall in migration rates; and Malaysia's migration has been variable in the past with a large increase in the 1960s, followed by a small decrease in the 70s; most recently migration has steadied at a healthy 4-5%. Migration to Indonesia has steadily declined over the entire period, as migrants from other countries have left Indonesia and returned to their countries of origin.

Table 2: Percentage Change in Net Migration* per Annum

	1960-1970	1970-1980	1980-1990	1990-2000	1960-2000	1980-2000
China	1.3	-15.1	5.2	9.0	-0.3	7.1
Hong Kong SAR, China	0.5	1.9	0.7	1.9	1.2	1.3
Indonesia	-4.5	-4.5	-4.5	-10.7	-6.1	-7.7
Japan	0.5	1.0	2.9	4.6	2.2	3.8
Malaysia	29.2	-0.9	3.5	4.7	8.5	4.1
Philippines	-0.1	-5.6	1.1	9.0	1.0	5.0
Singapore	0.2	-0.1	3.3	6.4	2.4	4.8
South Korea	2.9	11.4	0.8	-0.1	3.6	0.4
Thailand	-3.3	-2.4	0.5	9.1	0.9	4.7
Vietnam	1.0	1.0	4.1	18.7	6.0	11.2

Source: Özden et al. (2011)

Note: *Net migration refers to migration into a country minus migration out of a country.

Athukorala (2006) reviews migrant labor policies in East Asia and points out that most countries in East Asia have historically lacked well-defined migrant labor management programs. An exception is Singapore. It has had a long-standing and well-defined migrant labor policy, applying industry-specific quotas and levies on employers for hiring low-skill migrant workers, and has been able to leverage its migrant labor force to make substantial contributions

³ Please see Debrah (2002), Ananta and Arifin (2004), Massey and Taylor (2004), and more recently, the Asian Development Bank (2008)

to its growth. Malaysia; Taiwan, China; and South Korea have more recently recognized the potential role of migrant workers in their long run economic planning, and have been reforming their migrant labor policies as a result. For example, Malaysia has been reforming its migrant labor policies since the 1980s, signing a series of bilateral labor supply agreements to regulate labor inflows and introducing industry and skill specific levies on employers hiring migrant workers (Kanapathy, 2004).

3. Analytical Framework

Our analytical framework involves the application of a dynamic global general equilibrium model (*GMig2Dyn*) to simulate a projected growth path of the world based on current best-estimates of population, real GDP and labor growth from international institutions over the period 2007-2050.⁴ As part of this projected growth path, we simulate more liberal international migration policies that allow the labor-force shrinking Asian countries to import labor from those Asian countries where the labor-force is expanding.

3.1 Simulation Modeling

The dynamic migration model (*GMig2Dyn*) is based on the Dynamic GTAP (*GDyn*) model developed by Ianchovichina and McDougall (2001) and the bilateral migration model (*GMig2*), developed by Walmsley et al. (2009). Both the *GDyn* and *GMig2* models are based on the *GTAP* standard general equilibrium model. The standard *GTAP* model is a comparative-static general equilibrium model of the world economy (Hertel 1997).

In the standard *GTAP* model, capital can move between industries within a region, but not across regions. The *GDyn* model extends the standard model by incorporating international capital mobility and capital accumulation. Furthermore, *GDyn* takes account of foreign income flows and wealth, by keeping track of both the ownership and location of capital assets. In the *GDyn* model, international capital mobility is modeled using a disequilibrium approach. *GDyn* assumes an adaptive expectations mechanism that permits errors in expectations. These errors

⁴ We show results from 2007, but the GTAP 7 Data Base has a base year of 2004 so we had to update it first to 2007.

in expectations are gradually eliminated, and rates of return on investment gradually equalize across regions, resulting in a gradual movement of economies towards steady state growth.

The *GMig2* model extends the *GTAP* model to consider skilled and unskilled bilateral labor movement across countries, and their impact on growth, remittances and the real incomes of migrants and permanent residents. The bilateral nature of the *GMig2* model allows us to analyze the effect of changes in the destination country's immigration policy, targeting particular migrant origin countries. The movement of labor of type i from region c to region r (i.e. changes in labor force which are changes in $LF_{i,c,r}$) can be determined exogenously, for example through changes in quotas, or endogenously in response to changes in relative real wages. Where migration occurs endogenously, workers (or labor supply) are assumed to respond to changes in the expected real wages between the home ($RW_{i,c,c}$) and potential host ($RW_{i,c,r}$) region according to equation (1).

$$LF_{i,c,r} = A_{i,c,r} \times \left[\frac{RW_{i,c,r}}{RW_{i,c,c}} \right]^{ESUBMIG_{i,c,r}} \quad (1)$$

$A_{i,c,r}$ is a coefficient which takes into account other factors in the migration decision (e.g., language, distance etc.) and is calibrated from the underlying *GMig2* Data Base. $ESUBMIG_{i,c,r}$ is a parameter reflecting the extent to which migration responds to changes in the relative expected real wages and is set to 1 in this paper. The extent to which migration is endogenous is dependent on this parameter. Increasing this parameter increases the number of migrants moving, but does not change the directions of their movements.⁵ A low parameter value means that the ability of migrants to respond to changes in real wage differentials is limited, due to excessively high costs associated with such movements. Such costs could include difficulties finding a job in the host economy or distance from one's family.

Note that Equation (1) is calibrated on actual data and incorporates the current state of restrictions on migration in the host country.⁶ Figure 1 is used to further explain this. It is

⁵ The authors also tested the model with $ESUBMIG=0.4$.

⁶ Given $ESUBMIG_{i,c,r}=1$.

assumed that demand and supply of migrants are equal and hence the labor market is in equilibrium (see Figure 1). The labor supply curve is upward sloping – as wages available to migrants in the host region rise relative to those in the home region, migration to the host country increases. When there are no restrictions on migration imposed by the host country, the equilibrium is represented by point A in Figure 1 where demand equals supply ($L_s=L_d$). Equation (1) is the labor supply curve.

Figure 1: Demand and Supply of Migrants (Equation 1)

Turning now to the more likely case of restrictions on migration, the dashed line in Figure 1 is used to depict the situation where a quota (or cost to migrants, either implicit or explicit) has been applied to restrict the number of migrants. In this case migration is lower than it would be without the quota, and the wage paid by firms (Point B, determined by L_d) is much higher than the wage required by the migrant worker (Point C, determined by L_s). The difference between B and C is the rent or cost of the quota induced by the migration restrictions. There are a number of alternative agents who are likely to share this rent, including 1) migration agents in the home or host country who charge fees for obtaining visas and/or finding the migrant a job; 2) the host country employer who could pay migrant workers lower wages,

keeping the rent for themselves; 3) the host government through charges for visas or additional taxes on migrants; 4) the home country government, if agreements have been made between governments for transfers (for example, to pay for education expenses); or 5) the migrant worker themselves. In this case we assume that all of the rent is earned by the migrant worker.⁷

We argue that this quota reflects the *status quo* in the host economy and the preferences of its people and firms for migrant workers. This means that the current equilibrium is the point at which the preferences of the incumbent population for migrants are exactly balanced against the firms' desire for more workers. Rather than eliminating this quota altogether, we assume that as populations, and in turn labor forces, change and economies grow, the host economies will adjust their quotas in response to firms' demands for more labor. The resulting labor supply curve is given by Ls_1 , and is higher than the original supply curve (L_s). As mentioned above, this is due to the fact that the initial rents, which reflected the preferences of the country towards migration, remain in place. Equation (1) therefore represents this derived labor supply curve (Ls_1 in the case of restrictions). The implication of this is that only changes in the expected relative wages will drive new migration. If you want migrants to respond to the initial differences in wages, i.e., the initial restriction depicted by the value of the rent, then this rent would have to be removed so as to move the equilibrium back to point A.

In summary, the dynamic migration model (*GMig2Dyn*) therefore features:

- a) the accumulation of capital over time;
- b) the ownership of capital and the income flows to those capital owners;
- c) the movement of migrants and other changes in the labor force over time;
- d) the flow of remittances back to the families of the migrants; and
- e) the real incomes of migrants and permanent residents.

The model also separately identifies domestic and foreign workers by sector of employment. Foreign and domestic workers of the same skill type are treated as imperfect

⁷ Due to data limitations it is difficult to ascertain the value of this rent, and by making this assumption we avoid the need to calculate its value. Given we do not reduce this rent during the simulations this has assumption has minimal effect on our results. If this rent were to be reduced, it would be important to clearly allocate this rent appropriately.

substitutes, but there is no distinction between foreign countries. That is, firms demand foreign workers without regard to their country of origin (Aguilar, 2009).

In addition, this version of the model also includes unemployment of endowments (capital, skilled and unskilled domestic and foreign labor) through the inclusion of an elastic segment in the previously inelastic labor supply curve.⁸ This is achieved through a complementarity which sets employment equal to the natural rate of employment, unless a fall in demand is sufficient to drive the expected real wages down by more than a threshold rate of change. In the next period, the employment rate will attempt to move back to the natural rate, but this will only be achieved if demand is sufficient to return the economy to the natural rate without further lowering wages more than the threshold rate of change. Provided the economy does not continue to be hit by negative shocks, employment is expected to gradually move back to the natural rate of employment. This allows us to capture unemployment resulting from the global financial crisis.⁹

In Equation (1) the real wage is adjusted to take account of the probability of employment once the migrant arrives in the host region. Real wages ($RW_{i,c,r}$) are calculated as the average expected real wage of the entire labor force, regardless of employment status; hence the expected real wage that a migrant faces once the migrant arrives in the host region includes unemployment. If unemployment in the host economy rises then the expected real wage falls, due to a higher probability of unemployment, and hence migration falls. This reflects a main assumption of the Harris-Todaro model that the migration decision between rural and urban areas is based on expected income differentials, rather than just wage differentials.

Underlying the *GMig2Dyn* model is a database that captures both bilateral labor (GMig2 Database) and foreign ownership of capital (GDyn Database); as well as the core GTAP 7 Data Base (Narayanan and Walmsley, 2008). For this study, we have updated the GMig2 database to

⁸ For simplicity of the diagrams, we assume that labour supply is fixed. In the model there will be some interaction between total labour supply in an economy and the demand and supply of migrants, which responds endogenously to real wage changes and unemployment, hence the total labour supply curve is slightly upward-sloping.

⁹ See Strutt and Walmsley (2010) for more details on how unemployment was incorporated.

2004, the base year of the GTAP 7 Data Base. The bilateral migration data is based on a new migration data base by Özden et al. (2011) and the remittances data were also updated, using the IMF's balance of payments statistics on remittances and workers compensation.

Further adjustments are also made to the database in order to improve the distribution of unskilled foreign workers across sectors. Estimates of the number of unskilled foreign workers by industry were obtained for Malaysia, Korea, Singapore, and Thailand from Yean and Siang (2010); Hur (2010); Teng (2010); and Holumyong and Punpuing (2010) respectively, see Table 3. For other ASEAN countries – Indonesia, Philippines, and Vietnam – we use the average distribution of unskilled foreign workers by industry of the aforementioned countries as a proxy. For all other countries foreign and domestic workers are assumed to be allocated across sectors in the same proportions according to the underlying total data available in the GTAP Data Base. The choice to redistribute unskilled workers by industry for Indonesia, the Philippines and Vietnam, but not for the other economies, reflects the fact that Asia is the focus of this paper, and there is reason to believe that the sectoral relationships in the other Asian economies exist across all Asian economies. ASEAN thus tends to use unskilled foreign workers more intensely in agriculture and food processing; while Singapore and South Korea use unskilled foreign workers in food processing, light and heavy manufactures, construction and services, in some cases.

Table 3: Distribution of unskilled foreign workers across sectors in ASEAN countries

	Manufacturing	Construction	Services	Agriculture
Malaysia	35.12	14.79	24.74	25.35
South Korea	41.61	22.30	34.16	1.93
Singapore	25.00	26.00	49.00	0.00
Thailand	15.39	16.75	31.31	36.55
Average (Indonesia, Philippines and Vietnam)	27.88	19.01	33.15	20.26

Sources: Yean and Siang (2010); Hur (2010); Teng (2010); and Holumyong and Punpuing (2010)

3.2 Scenarios

The model simulates the world economy from 2007 to 2050, under migration policies that allow labor to move freely within the EAP region in response to changes in real wages. These labor movements are in addition to, and the result of, the demographic and labor force

changes that are also projected to occur. The results are then decomposed to examine the impact of the regional migration liberalization on the world economy over time, as well as the other changes in the world economy.

The analysis takes into account the impact of the demographic changes expected to occur in Asia over the next 43 years, from 2007 to 2050. It includes population and labor force forecasts by skill that are based on the World Bank's and the UN's World Population Prospects 2008 Revision. The scenario also tracks actual and expected future changes in Real GDP from 2007 to 2012. Beyond 2012 calibrated technological change is assumed to persist (declining gradually) to 2050. Between 2007 and 2012 additional assumptions are made to take account of the global financial crisis, including additional adjustments to investment through a rise in errors in expectations, unemployment of labor and capital, government spending and a negative productivity shock aimed at capital, following Strutt and Walmsley (2010). After 2011 the financial crisis gradually comes to an end and unemployment falls back to pre-crisis levels.

Ignoring endogenous migration for the time being, both the domestic and foreign labor forces are assumed to grow at the projected growth rate in total labor. Increases/decreases in the domestic labor supply are implemented as changes in the natural rate of population growth, while foreign labor increases are implemented through changes in migration.¹⁰ The change in foreign labor keeps the share of migrants in the total population constant.¹¹ Since these labor forecasts are meant to include migration we assume that foreign labor grows at the same rate as the domestic labor force. This means that a country is willing to exogenously increase migration (increase the quota) to keep the migrant shares constant. The impact of including forecasts is discussed below – these are referred to as the “forecast” results. Next we liberalize migration by allowing it to respond to wage changes – these results are labeled “liberal” below and are also referred to as ‘endogenous migration’ in the text.

¹⁰ We assume that children born to migrant workers are included in the natural population and that all new migrant workers come from abroad.

¹¹ With the exception of Japan and South Korea where we assume that migrant growth is zero. Hence when combined with negative growth of incumbent labour, migrant shares increase slightly.

Thus migration in this scenario results from two sources: first, we assume that a country is willing to exogenously increase migration to keep the migrant shares constant (forecasts); and second, we assume that migration is liberalized so that migrants can respond endogenously to changes in the real wages in the home and host economies (liberal). These two sources of migration may work in opposite directions. For instance, an economy with a growing population will increase the number of migrants to keep the share of migration in its total population constant; on the other hand, the same country may experience declining wages due to its rising population which will cause outward migration of its own population and return migration of its foreign population, thereby negating the exogenous increase in migration.¹²

4. Simulation Results

In this section we examine the results of the scenario in terms of the projected demographic changes, changes in bilateral migration in response to the changes in wages resulting from the demographics and the impact of these on the EAP economy.

4.1 Demographic Changes and Real Wages

Figures 2 and 3 show the yearly forecasted growth rates of skilled and unskilled labor forces obtained from the World Bank and United Nations. According to these data there is an unmistakable downward trend in skilled labor growth rate in all countries, with forecasted growth rates becoming negative or falling to almost zero in all of developed economies of Asia – Hong Kong SAR, China; Japan; Singapore; South Korea and Taiwan, China – as well as in China and Thailand. The forecasted unskilled labor growth, on the other hand, does not decline as significantly as skilled labor, although it is negative or close to zero for the same seven economies – China; Hong Kong SAR, China; Japan; Singapore; Taiwan, China; Thailand; and South Korea.

¹² The reader should therefore not interpret that these large decreases in migration or return migration are large flows of people going back to their home economies, instead they are migrants choosing not to migrate in the first place or choosing to migrate elsewhere instead.

Figure 2: Forecasted Annual Growth Rates in Skilled Labor by Region

Source: Authors' results

Figure 3: Forecasted Annual Growth Rates of Unskilled Labor by Region

Source: Authors' results

Figures 4 and 5 show the cumulative percentage changes over time of the real factor prices of skilled and unskilled labor resulting from these forecasted demographic changes in the EAP region. Hong Kong SAR, China stands out as an economy with the largest changes in real wages as a result of the demographic changes. This is not surprising given the low growth in skilled and unskilled workers, combined with the high accumulation of capital and forecasted changes in real GDP. The figures show that real wages in Hong Kong SAR, China are 350% higher in 2050 than they were in 2007 for skilled workers and 600% higher for unskilled workers. The next highest increases are in the Rest of East Asia and Thailand where real wages rise by 200% relative to 2007. As expected, six of the seven economies – China; Hong Kong SAR, China; Japan; Taiwan, China; Thailand; and South Korea – highlighted above for having the lowest growth in skilled and unskilled labor, are also those the economies where factor prices rise consistently over time; while the other regions experience much slower growth in real wages. One such a case is Singapore, where despite low/negative growth in skilled and unskilled labor, the growth rate of wages is slower than in Hong Kong SAR, China or even Thailand. This is explained by the slower GDP growth forecasted for Singapore when compared to the rapid GDP growth forecasted for Hong Kong SAR, China and Thailand.

Figure 4: Cumulative Percentage Changes in Real Wage of Skilled Workers due to Forecasted Demographic changes

Source: Authors' results

Figure 5: Cumulative Percentage Changes in Real Wages of Unskilled Workers due to Forecasted Demographic changes

Source: Authors' results

4.2 The Impact of the Liberalization of Migration Policies on the Labor Force and Migration

Table 4 presents an overview of the changes in the labor force, by skill type and by country. The total change in the labor forces are decomposed into two main components: forecasts and changes due to liberal migration policies. The forecasts can be further divided into changes due to the natural rates of changes in permanent residents and our assumption that migration increases with population forecasts. The liberal migration policies component can be further divided into changes in changes in the number of migrants located in the country/region and changes in permanent residents through outward or return migration. The labor forces of all countries, except for Japan, increase over time. The decrease in Japan is due to the fact that the demographic changes occurring in this country are not offset by migration. China's and Indonesia's labor forces increase the most, due to positive natural population growth over the period and high initial populations. These changes are the result of the forecasts discussed above.

In this model, it is the changes in the real wages occurring as a result of the financial crisis, economic growth and demographic changes that drive the endogenous migration. Migration between two countries depends on the changes in the real wages in both the host and the home country and any changes in unemployment (Equation 1). Moreover, this model depends on a database that only captures migrants recorded in the census – illegal migration is therefore likely to be under-reported.

Hong Kong SAR, China's labor force increases the most as a result of more liberal migration policies, with 1.72 million more workers, of which 1.71 million are new migrant workers and 0.02 returning migrants. China and Malaysia have the largest decreases in their labor forces as a result of liberal migration, with 0.95 and 1.57 million fewer workers respectively. The implication is that migrants that would have otherwise moved to China or Malaysia (as in the baseline), would rather migrate to Hong Kong SAR, China when given the opportunity (as under endogenous migration as a function of changes in expected real wages).

Table 4: Decomposition of the Changes in Labor Force by Country between 2007 and 2050 (Millions of People)

	Total		Forecasts				Liberal Migration			
	Change in Labor Force		Change in Permanent Residents (Natural growth due to births/deaths)		Change in Migrants		Change in Migrants		Change in Permanent Residents (Return or Outward Migration)	
	Unskilled	Skilled	Unskilled	Skilled	Unskilled	Skilled	Unskilled	Skilled	Unskilled	Skilled
	I	II	III	IV	V	VI	VII	VIII	IX	X
China	157.0	31.9	158.2	31.6	0.02	0.04	-0.01	-0.02	-1.20	0.29
Hong Kong SAR, China	1.0	0.8	-0.5	0.1	0.01	0.41	1.46	0.25	0.00	0.02
Indonesia	85.0	29.1	85.0	28.7	0.03	0.11	-0.04	-0.10	0.02	0.43
Japan	-13.1	-10.1	-13.1	-10.2	0.00	0.00	-0.01	0.07	0.00	0.02
Malaysia	9.7	6.3	9.6	6.0	0.35	1.62	-0.21	-1.30	-0.02	-0.05
Philippines	46.6	10.9	46.4	10.5	0.12	0.26	-0.04	-0.14	0.05	0.33
Rest E. Asia	9.4	0.7	9.5	0.7	0.08	0.03	0.00	0.00	-0.14	0.06
Rest S.E. Asia	24.9	4.7	24.9	4.5	0.10	0.16	0.00	0.00	-0.05	0.06
Singapore	0.2	0.1	0.2	0.0	0.06	0.07	-0.06	-0.01	-0.04	0.08
South Korea	-0.6	3.7	-0.7	3.7	0.02	0.08	0.09	-0.07	0.04	-0.04
Taiwan, China^a	1.3	-0.1	1.3	-0.1	NA	NA	NA	NA	0.00	0.02
Thailand	2.8	5.2	2.6	5.0	0.02	0.16	0.11	-0.03	0.05	0.11
Vietnam	38.6	2.9	38.6	2.9	0.01	0.01	-0.01	0.00	0.00	0.03

Source: Authors' results

Note: a. no data on migrants are available for Taiwan, China.

Under the more liberal migration framework, China, Malaysia, Indonesia, the Philippines, and Singapore receive fewer migrant workers by 2050, although the overall impact on the labor force (in terms of people) in Indonesia and the Philippines is positive due to return migration. Skilled workers in China and Singapore also increase for the same reason, return migration of skilled workers (Column X in Table 4). The liberal migration policies also cause the return migration of people from Hong Kong SAR, China and an increase in outward migration of Chinese and Malaysian residents.

Figures 6 and 7 compare the forecasted growth in skilled and unskilled labor with the growth in skilled and unskilled labor under more liberal migration for selected countries,

respectively, over time. Looking at Figure 6, this comparison highlights several interesting points.

- First, endogenous migration does not alter the growth of the labor force significantly in most economies. Only in Hong Kong SAR, China, where migration is highest, does the growth rate of labor rise by just over 1%. This is because migrants are generally a small share of the labor force in most Asian economies.
- Second, another interesting feature of endogenous migration is the extent to which migrants react to the global financial crisis. During the global financial crisis, real GDP and real wages fall, while unemployment rises. The combination of falling real wages and higher unemployment in the host economy generally reduce migration flows under the endogenous migration scenario, albeit the direction can be sometimes unclear if wages and employment also fall in the home country. Prior to 2020, Figures 6 and 7 show clear evidence of some temporary declines in migration (or increased return migration) due to the financial crisis – only migration to East Asia increases. Labor growth with endogenous migration is therefore generally below forecasted labor growth during the financial crisis (2007-2012) – in 2012, the number of migrants globally was 0.82 million lower than under the forecast scenario.
- Third, once the effects of the global financial crisis have dissipated (usually between 2012 and 2020), the demographic effects come into play and migration towards those Asian economies experiencing lackluster population growth becomes more evident. Overall, migration due to the financial crisis is temporary and does not affect the demographic story. Figure 6 indicates that if migrants are free to move in response to wages, Hong Kong SAR, China and Singapore would have mostly increasing growth rates of skilled labor force after 2020, relative to the forecasts. For Malaysia and the Rest of East Asia the model predicts only a marginally smaller growth rate of skilled workers than originally forecasted.

Figure 7 compares forecasted growth with endogenous growth for unskilled migrant labor, with similar conclusions to those found with skilled labor in Figure 6. The growth of unskilled labor with endogenous migration would be higher than forecasted unskilled labor for Hong Kong SAR, China after the crisis; prior to the crisis growth rates are lower, but recovery is quick with growth exceeding forecasts by 2011. In Singapore, endogenous migration causes a larger decline in the growth rate of unskilled labor relative to the forecasts until 2015. After 2015, the unskilled labor force growth rate recovers quickly, but it is not until 2035 that the growth rate under endogenous migration surpasses the forecasted growth. As with the skilled labor force, Malaysia's unskilled labor force growth would be slower than originally forecasted when considering endogenous migration, albeit the differences are minimal (Figure 7).

Figure 6: Forecasted versus Endogenous Migration Annual Growth Rates of Skilled Labor for Selected Countries

Source: Authors' results

Figure 7: Forecasted versus Endogenous Migration Annual Growth Rates of Unskilled Labor for Selected Countries

Source: Authors' results

Changes in the labor force depend on the changes occurring within the bilateral migration corridors, and the relative productivities of those migrants. Figures 8A, 8B, 9A, and 9B describe the unskilled and skilled labor migration corridors that expanded or contracted the most over the period. These changes in the migration corridors are the result of both the exogenous changes in forecasts and the endogenous migration due to more liberal migration policies.

The largest changes in bilateral migration are the outflow of Chinese migrants from Singapore and Indonesia into Hong Kong SAR, China in response to the increase in real wages in Hong Kong SAR, China relative to those in Singapore and Indonesia. This is the result of the very large increases in real wages in Hong Kong SAR, China and the large number of Chinese already living in Hong Kong SAR, China. Migrants from Rest of East Asia are also entering Hong Kong SAR, China and South Korea in response to the higher wages, while Chinese migrants also enter the Rest of East Asia¹³ to fill the gap left by migrating East Asians. Unskilled South Koreans also return home from Japan as relative wages at home rise, as do skilled Filipinos.¹⁴

Thailand, which was also experiencing large increases in real wages in response to demographic changes, receives large increases in migrants from Southeast Asia. Even though real wages in Malaysia decline relative to many of the other countries and migrants from the Philippines and Thailand return home, they are still able to attract migrants from Indonesia, where growth in the labor force continues to be robust over the entire period. Moreover many unskilled Malaysian migrants return home from Singapore, and skilled Singaporean return home from Malaysia.

¹³ The inflow of Chinese into East Asia is primarily due to the forecasted increase in the labour supply in East Asia, rather than as a result of more liberal immigration policy.

¹⁴ Skilled real wages of Filipinos increase faster than those in Japan up until 2040 (see Figure 4).

Figure 8A: Unskilled Worker Migration Corridors in EAP that Expanded the Most between 2007 and 2050 (Excluding Hong Kong SAR, China).^a

Source: Authors' results

Note a. Number of unskilled migrant workers by location/home region

Figure 8B: Skilled Worker Migration Corridors in East Asia and the Pacific that Expanded the Most between 2007 and 2050.^a

Source: Authors' results

Note: a. Number of unskilled migrant workers by location/home region

Figure 9A: Unskilled Worker Migration Corridors in East Asia and the Pacific that Declined the Most between 2007 and 2050.^a

Source: Authors' results

Note: a. Number of unskilled migrant workers by location/home region

Figure 9B: Skilled Worker Migration Corridors in East Asia and the Pacific that Declined the Most between 2007 and 2050 (excluding Singapore / China).^a

Source: Authors' results

Note: a. Number of unskilled migrant workers by location/home region

These trends generally reflect the relative changes in real wages, although there are other factors that also feature:

- a) trends that also include the exogenous changes in migration¹⁵ and hence population due to the forecasted changes in labor;
- b) the movement of the migrants themselves also affect real wages and hence the decision to migrate;
- c) migrants and domestic workers are not perfect substitutes in this model and hence the wages of migrants may differ from the average wages depicted in Figures 4 and 5; and
- d) the real wages in Figures 4 and 5 do not take account of changes in unemployment due to the financial crisis.

When we examine the disposition of the nationals from a specific country – specifically, how many of them are expatriates – we see that all countries have seen increases in the number of people that are living outside the home region (column I, Table 5). However, as a share of their total population regardless of their current location, there are fewer Indonesians, Malaysians, Filipinos, and Vietnamese living overseas (column II, Table 5). For example, more than 5.2 percent of all Malaysians were living outside Malaysia, representing 0.65 million people in 2007. By 2050, the total number of Malaysians living overseas increased by 0.19 million, although the share of all Malaysians living overseas has fallen by 2.13 percent.

¹⁵ The extent to which migration occurs also depends on the choice of the parameter *ESUBMIG* in Equation (1). We chose a value of one and undertook sensitivity analysis. In this sensitivity analysis we found that lowering *ESUBMIG* to 0.4 lowered absolute changes in migration, however the direction of the flows of the migrants was the same.

Table 5: Changes in National Populations Living Outside the Home Region, 2007-2050

	Liberal		Forecasts		Additional Effect of Endogenous Migration	
	Change in Number of Expatriates (millions)	Change in share of Expatriates in Total Nationals (%)	Change in Number of Expatriates (millions)	Change in share of Expatriates in Total Nationals (%)	Change in Number of Expatriates (millions)	Change in Share of Expatriates in Total Nationals (%)
	I	II	III	IV	V	VI
China	2.93	0.21	1.17	0.06	1.77	0.15
Hong Kong SAR, China	0.11	6.51	0.09	7.28	0.02	-0.77
Indonesia	0.59	-0.09	0.64	0.09	-0.05	-0.18
Japan	0.12	0.60	0.09	0.64	0.02	-0.05
Malaysia	0.19	-2.13	0.10	-2.36	0.09	0.23
Philippines	0.49	-1.57	0.51	-1.19	-0.02	-0.37
Rest E. Asia	0.19	-0.21	0.09	-0.56	0.11	0.35
Rest S.E. Asia	4.36	1.53	0.20	-0.27	4.16	1.80
Singapore	0.06	2.13	0.03	0.53	0.04	1.60
South Korea	0.14	0.05	0.12	0.06	0.02	-0.01
Taiwan, China	0.06	0.23	0.05	0.35	0.01	-0.12
Thailand	0.07	0.02	0.15	0.35	-0.08	-0.33
Vietnam	0.27	-0.64	0.26	-0.61	0.01	-0.03

Source: Authors' results

4.3 The Macroeconomic Impact of the Liberalization of Migration

Table 6 shows the impact on GDP decomposed into changes in capital, skilled and unskilled permanent residents and migrants, and technological change. The changes in real GDP depend on these changes in the workforce caused by the migration and on these changes and the importance of each of these in real GDP (shown by the initial shares). The results are also divided into forecasted changes in natural population growth and migration; and endogenous migration due to more liberal migration policies. Overall real GDP rises over the period due to forecasted changes in the labor force, increased capital accumulation and technological changes. Only Hong Kong SAR, China; Japan; Singapore; and Taiwan, China experience declining skilled and/or unskilled forecasted labor growth, which would have adversely affected the overall positive growth in real GDP. The decline in technological change in Singapore stems from the

fact that growth in capital is strong, while forecasted growth in real GDP over the period is relatively low, particularly when the financial crisis is taken into account.¹⁶

The impact of new migrants on real GDP is the result of both changes in forecasted migrants and the more liberal migration policy. Overall only Japan and Singapore experience a decline in unskilled migrant workers which impact real GDP negatively (VIII outweighs VII, Table 6). Skilled migration is positive overall for all regions (XII outweighs any declines in XIII, Table 6).

Although there is an increase in migration into Japan and eventually also into Singapore, the inflow of new migrants seems surprising low when compared to Hong Kong SAR, China, especially given that Japan and Singapore experience similar demographic changes to Hong Kong SAR, China. This lack of migration into Singapore and Japan can be attributed to the lackluster growth in forecasted real GDP over the period. The new liberal policies allow migrants to respond to real wages. However, if real GDP does not increase substantially (as it does in Hong Kong SAR, China) then there are no incentives for migrants to move to Singapore and Japan. In the case of Singapore, only skilled Singaporeans living in Malaysia are incentivized to move home. It is not until the long run effects of the financial crisis have dissipated (2035) that migration into Singapore from other regions increases enough for labor growth to exceed forecasted growth (Figures 6 and 7) and for the beneficial effects of migration to at last be seen. In Japan, the low initial share of migrants in the labor force, lackluster growth in real GDP, and increased competition from Hong Kong SAR, China for Japan's traditional Asian migrants, make Hong Kong SAR, China a much more attractive destination to migrants than Japan. Despite the relatively small size of the increase in migrants into Japan, even this small increase in migration has a positive effect on Japan's real GDP. Singapore's growth is also much higher in the later years when migration finally becomes positive.¹⁷ For this reason Singapore and Japan may want

¹⁶ Technological change is calibrated as the residual between real GDP growth and growth in endowments (Solow growth residual).

¹⁷ Although by 2050, the gains had not yet outweighed the losses from earlier years where there was considerable outward migration of unskilled workers. It is expected that if migration flows into Singapore continued, real GDP would have risen above forecasted soon after 2050.

to consider more aggressive liberalization of their migration policies, by reducing the implicit costs to migration (or rents in Figure 1), thereby allowing demand by firms and the supply of migrants to increase.¹⁸ Japan and Singapore might then be able to attract migrants from alternative sources, such as the Philippines, Thailand or from outside of the region.

China also gains in terms of real GDP as a result of the liberalization of migration policies, although the increase in skilled labor is due to return migration, not new migrants. In general the economies in East Asia (China; Hong Kong SAR, China; Japan; and South Korea) all gain from the liberalization of migration and from the increased capital accumulation that accompanies it (column III, Table 6), while those in Southeast Asia (except Vietnam) experience small losses.

The small losses in Southeast Asia occur because of the declines in the labor force and/or capital. Changes in the labor force are driven by changes in the number of workers weighted by their productivities. Decreases in the labor force therefore occur if decreases in the number of new migrants and/or outward migration offset return migration, or if migrants leaving are more productive than those entering. In Indonesia and the Philippines the skilled labor forces decline with migration, despite large return migration¹⁹, causing slight falls in real GDP. In Singapore, despite the high return migration of skilled Singaporeans, reduced capital accumulation and unskilled labor cause real GDP to fall. This highlights the importance of access to unskilled workers by developed economies like Singapore. In Thailand the loss in capital and skilled migrants as a result of the liberalization of migration policy causes a slight decline in real GDP. Malaysia's real GDP falls with increasing outward migration of both skilled and unskilled labor, and decreased inward migration. Finally, Vietnam, gains due to an increase in new and returning skilled migrants.

¹⁸ This would then allow migrants to respond to absolute wage differentials, not just changes in wages.

¹⁹ Returning skilled migrants are less productive than the skilled migrants that are returning to Singapore, Malaysia and East Asia.

Table 6: Decomposition of the cumulative change in Real GDP between 2007 and 2050 into Capital, Unskilled and Skilled Permanent residents and Migrants and Technological Change due to Forecasts and More Liberal Migration

	Capital			Unskilled					Skilled					Tech change ^c	Actual GDP	
	<i>Initial share</i>	<i>Forecasts</i>	<i>Liberal</i>	<i>Initial share</i>	<i>Permanent Forecasts</i>	<i>Liberal</i>	<i>Migrants Forecasts</i>	<i>Liberal</i>	<i>Initial share</i>	<i>Permanent Forecasts</i>	<i>Liberal</i>	<i>Migrants Forecasts</i>	<i>Liberal</i>	<i>Forecasts</i>	<i>Forecasts</i>	<i>Liberal</i>
	ln VA ^a	% Δ ^b	% Δ	ln VA	% Δ	% Δ	% Δ	% Δ	ln VA	% Δ	% Δ	% Δ	% Δ	% Δ	% Δ	% Δ
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
China	43%	391.3	0.08	40%	18.7	-0.1	18.7	-13.4	11%	81.3	0.4	81.3	-24.5	157.7	434.4	0.05
Hong Kong SAR, China	54%	941.2	5.1	25%	-23.5	0.2	0.4	129.1	20%	34.2	5.7	57.1	22.4	108.2	664.2	14.1
Indonesia	51%	519.4	-0.2	32%	80.2	0.01	68.7	-20.8	8%	199.3	1.1	199.3	-57.5	54.1	328.5	-0.1
Japan	44%	99.4	0.1	35%	-27.5	0.01	0.0	-4.0	21%	-49.3	0.2	0.0	21.3	61.9	55.8	0.2
Malaysia	46%	509.7	0.2	37%	96.2	-0.08	82.8	-26.9	12%	307.5	-0.6	307.5	-61.0	84.7	564.8	-2.9
Philippines	58%	1112.4	0.1	26%	130.4	0.07	110.3	-4.9	11%	232.5	2.3	232.5	-17.8	141.8	1179.1	-0.02
Rest E. Asia	49%	257.9	-0.2	34%	72.7	-0.7	72.7	0.0	12%	40.1	2.8	40.1	0.0	48.6	223.4	-0.02
Rest S.E. Asia	43%	658.2	-0.2	29%	67.2	-0.09	0.0	0.0	8%	103.4	0.5	0.0	0.0	112.4	385.2	-0.04
Singapore	52%	602.9	-0.8	30%	15.8	-2.6	12.6	-14.2	18%	-6.1	21.2	11.9	-4.3	-31.8	124.7	-0.5
South Korea	48%	333.6	0.02	34%	-1.8	0.2	8.5	33.5	15%	63.0	-0.4	63.0	-35.2	109.1	244.1	0.00
Taiwan, China	40%	467.0	0.2	35%	11.9	0.00	11.9	0.0	24%	-9.2	1.5	7.7	0.0	18.2	148.0	0.4
Thailand	64%	258.3	-0.4	21%	7.1	0.1	7.3	18.5	9%	61.7	1.0	61.7	-8.2	310.9	471.2	-0.04
Vietnam	38%	349.5	-0.01	38%	86.5	0.00	72.8	-14.4	12%	51.3	0.4	51.3	10.3	203.1	405.3	0.06

Source: Authors' results

Note: a. ln VA – this is the initial share in value added.

b. % Δ – Percent change

c. Technological change is calibrated as the residual between Real GDP growth and growth in endowments (Solow growth residual). Technological change for a given country has been weighted by considering whether it was on capital, labor or other endowments.

Table 7: Macro Results: Cumulative change between 2007 and 2050 due to Forecasts and More Liberal Migration

	Real wage-Skilled		Real wages-Unskilled		Exports		Imports		Trade Balance ^a	Real Income ^b	Remittances in ^a		Remittances out ^a	
	Forecasts	Liberal	Forecasts	Liberal	Forecasts	Liberal	Forecasts	Liberal	Liberal	Liberal	Forecasts	Liberal	Forecasts	Liberal
	% Δ	% Δ	% Δ	% Δ	% Δ	% Δ	% Δ	% Δ	\$US Mill	\$US Mill	\$US Mill	\$US Mill	\$US Mill	\$US Mill
China	84.3	-0.2	70.8	0.1	654.8	0.6	229.5	0.9	2,317	12890	12245	447	147	-10
Hong Kong SAR, China	341.8	-6.6	579.3	-17.9	664.5	17.5	706.2	10.9	3,407	25219	1	0	12684	603
Indonesia	-21.8	0.08	-6.0	-0.3	371.5	-0.1	373.4	0	275	215	2366	26	94	-35
Japan	189.8	-0.3	119.3	0.2	47.9	-0.2	160.1	0.6	-10,296	13903	1771	-26	5430	70
Malaysia	-5.7	15.4	36.5	1.6	715.7	-3.1	771.4	-2.0	-3,087	1846	1145	42	2714	-316
Philippines	75.0	0.9	116.8	0.2	3360.0	0.2	1762.4	0.3	-188	-506	12425	-120	741	-19
Rest E. Asia	94.9	-1.8	34.0	0.3	238.9	-0.3	305.8	0.2	-207	415	1614	58	51	0
Rest S.E. Asia	120.7	-0.5	41.5	-0.1	194.0	-0.1	545.0	0.02	51	62	483	-3	340	0
Singapore	54.5	-5.6	39.5	4.0	150.5	-1.0	165.9	0.05	-4,167	1156	1439	8	1420	-89
South Korea	67.8	0.8	128.6	-0.6	357.9	0.6	262.4	0.4	2,935	441	1375	14	901	-12
Taiwan, China	91.9	-0.9	55.9	0.2	178.9	0.7	177.1	0.6	356	614	2625	-37	0	0
Thailand	194.7	-0.4	186.3	-0.8	508.8	0.09	402.4	-0.03	564	-1301	2554	-117	971	-3
Vietnam	206.8	-0.4	59.4	0.08	323.4	-0.08	306.6	0.07	76	471	3823	-9	52	0

Source: Authors' results

Note: a. Absolute change

b. Real income of permanent residents

Forecasted capital accumulation is the result of the dynamic mechanisms in the model that cause investment to add to available capital stocks, and the forecasted increases in skilled and unskilled labor (column II, Table 6). Capital also responds to the liberalization of migration policies. Countries that receive more migrants also experience increased production and hence increased returns to capital, thereby causing more investment and the expansion of capital over time. The reverse is true for countries experiencing outward migration, albeit the increase in remittances does offset this to some extent. In Malaysia and the Philippines the outflow of skilled workers abroad results in substitution towards capital which in turn has led to an unexpected increase in the return to capital; and hence in the long run, an increase in capital stocks. This increase in capital stocks however only begins after 2045 when migration flows start to reverse (Figures 9A and 9B).

Table 7 provides results for some other macroeconomic variables. The real wages of unskilled and skilled labor generally respond as expected – with real wages falling (rising) with increased (decreased) migration and labor forces in the long run. With the exception of Hong Kong SAR, China; Malaysia; and Singapore, most of the changes in real wages and labor forces are relatively small and therefore this amount of migration only partially offsets the demographic uncertainties experienced by these economies.

In those countries where inward migration increases, remittances out also rose; the reverse occurs in those countries that experience outward migration. With remittances out increasing the current account balance, and hence the trade balance, moves into surplus. Exports rise relative to imports. Consumption and hence imports also rise due to the increase in the migrant population and incomes. The exception is Japan, where remittances sent home are very small²⁰ and the increase in investment and capital inflows caused by the migration generally outweighs the impact of remittances on the trade balance.

²⁰ This is due to the fact that migrants in Japan are based on nationality rather than birth. Hence there are many Japanese born people listed as “migrants” living in Japan who not have families abroad to send remittances home to. Hence the remittance rate per person is very low.

Real incomes of the incumbent populations generally rise as a result of more liberal migration policies. The reason for this is that people are choosing to return home from countries with relatively lower wages (lowering remittances, but also raising incomes earned at home) or migrating to those countries with relatively higher wages (raising remittances). The reverse occurs in Thailand and the Philippines as migrants return home, lowering remittances and real incomes.

4.4 The Sectoral Impact of the Liberalization of Migration

The sectoral results are shown in Table 8. In general sectoral production grows over time with increased labor, capital and technological change (forecasts). Only Japan and Singapore experience some declines in production over the period 2007-2050 as decreases in unskilled labor cause production in certain labor intensive sectors to decline.

Under more liberal migration policies, Hong Kong SAR, China gains considerably as new migrant workers enter the labor force, allowing sectors to expand. Since there are increases in both skilled and unskilled migrant workers, all sectors gain as a result of the liberalization of migration policy. In Thailand, on the other hand, unskilled labor rises significantly more than skilled labor, and capital falls. This causes expansion in unskilled labor intensive industries and declines in skilled labor and capital intensive industries. The reverse happens in China and Japan where we see larger increases in skilled-intensive services and manufactures following the increase in skilled labor. Many of the gains in Thailand are in the agricultural sector which is very intensive in unskilled migrant workers.

Malaysia and Singapore experience the largest declines in sectoral output. Malaysia is similar to Thailand in that the largest declines are in skilled labor and hence skill-intensive industries suffer the most; while Singapore losses mostly unskilled workers like Japan. Since construction is an important part of investment goods, the gains or losses to the construction sector are closely aligned with the changes in the capital stock, although the sector will also be affected by the availability of unskilled migrant workers since most countries use migrant workers intensely in construction (Table 3).

Table 8: Cumulative Changes in Sectoral Production 2007-2050 due to Forecasts and the Liberalization of Migration Policy (\$US Millions)

	China		Hong Kong SAR, China		Japan		Malaysia		Singapore		Thailand	
	Forecasts ^a	Liberal	Forecasts	Liberal	Forecasts	Liberal	Forecasts	Liberal	Forecasts	Liberal	Forecasts	Liberal
Rice	74477	10	5	0	1468	12	784	-8	-1	0	60393	2
Wheat	55777	7	19	0	1138	-2	9	0	-7	0	52	0
Grains Crops	651722	-223	1059	7	11103	38	4076	-5	-203	-4	76256	-15
Cattle and Wool	112796	-40	940	4	4252	12	369	-1	-1	0	1990	-1
Other Animals	489377	282	5324	49	3372	24	5247	10	-12	0	10243	13
Meat Products	150836	78	711	61	3261	5	-264	14	127	-3	18422	13
Processed Rice	75832	10	2	1	1267	14	197	-1	92	-2	32349	16
Other Food	854926	98	24964	1074	136505	394	82565	-578	9144	-52	53530	14
Forestry	207409	-25	17	0	6609	-18	12447	-9	-9	0	8281	-1
Extraction	613449	7	71041	67	27507	2	46065	-5	-70	0	84474	1
Textiles	1306142	-1977	73981	4225	-11676	-788	8274	-168	-502	-52	39421	-143
Apparel	701527	-379	29541	3426	2928	-99	2324	-39	-395	-25	25869	-15
Leather Products	354667	-8	3032	361	-1060	-18	1470	-8	-211	-20	10443	-6
Wood and Paper Products	943963	-306	68036	1682	96975	90	35254	-180	3069	-107	40764	-45
Motor Vehicles	435941	-181	35741	300	307680	-483	61687	-185	1312	-15	131973	-34
Electronics	2068471	3604	133943	1008	14011	1806	944064	-2440	54847	-572	185559	251
Other Machinery and equip	1085880	-647	157785	1221	161595	-151	148953	-983	-11232	-370	76582	-27
Petroleum and Coal Products	595971	-136	3172	2	45003	121	52118	-206	41041	121	93406	-49
Chemicals, Rubbers and Plastics	1814282	-185	164222	1773	123697	199	266086	-699	52096	-473	172358	20
Metals	539549	-159	-5461	-639	130277	831	36629	-277	13881	-34	10843	1
Metal Products	289791	11	25143	348	71600	391	25032	-133	6313	-65	13118	1
Other Manufactures	1032318	1210	5392	62	71440	612	156469	-666	11916	-128	41634	2
Utilities	530825	-65	47415	961	87727	264	51837	-213	4340	-24	49813	-10
Construction	75593	-403	250696	1164	632354	3214	77886	-139	53229	219	77574	-111
Transport and Communications	3087662	-2775	1937158	38613	1491577	1243	206060	-1078	88027	-538	245549	-282
Business Services	1414860	104	267193	9785	772761	1771	131407	-855	87865	-458	150526	-38
Govt, Health and Educ	2836662	978	105254	3920	838907	2874	127815	-895	22710	69	179395	17

Note: a. These are results determined by the model corresponding to forecasts used in the baseline simulation.

5. Conclusions

This study analyzes the impact of a more liberal migration policy within the East Asia and Pacific region. Migration flows in this scenario results from two sources. First, we assume that the migration status quo of a country is one where the country's migrant shares in the labor force remain constant over time. Second, we assume that migration is liberalized so that migrants can respond endogenously to changes in the real wages in the home and host economies (liberal), in addition to the migrant flows that would occur to maintain the migrant share status quo. Overall, we find that increased migration results in gains to both the origin and destination countries in terms of real GDP or incomes.

When migrants are able to respond endogenously to changes in relative wages arising from changes in demography and other economic factors, there is increased migration to East Asia, as well as return migration by East Asians previously living as migrants elsewhere. With the exception of Thailand and the Philippines, all the East and Southeast Asian economies gain in terms of real income. Thailand and the Philippines experience substantial return migration, leading to lower remittances, which cause incomes to fall. The large inflows of migrants and return migrants into those East Asian economies experiencing the strongest demographic changes, also causes an increase in real GDP for those economies.

While the increases in migration are insufficient to completely offset the declining labor forces in the countries with shrinking populations, when migration is able to endogenously respond to international differences, labor and wages adjust to reduce the economic effects of the demographic changes over the period. Countries that receive more migrants also experience increased production and greater returns to capital, subsequently attracting more investment and capital growth over time. The combination of increased labor and capital leads to the increase in real GDP found in East Asia.

Even in Japan and Singapore, where the response of migration to the demographic changes was considered low, positive gains in real GDP from migration were evident. For this

reason Singapore and Japan might want to consider more aggressive liberalization of their migration policies to attract migrants.

Significant changes in migration patterns are also expected to occur over the period examined, 2007-2050. Countries that are currently net senders of migrants may become net recipients under a more liberal migration policy that allows endogenous movements in response to wage changes. For example, China, Indonesia, and the Philippines are currently net senders of skilled migrant workers. However, they became net recipients of skilled migrants as skilled workers return home in response to changes in relative wages. Conversely, net recipients of skilled migrants, like Malaysia, and unskilled migrants, like Singapore, under current migration policies, may become net senders of those migrants under a more liberal migration policy.

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