Global Trade Analysis Project
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This paper is from the
GTAP Annual Conference on Global Economic Analysis
https://www.gtap.agecon.purdue.edu/events/conferences/default.asp

Migration and Growth in East and South-East Asia

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Abstract

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

While migration would be unable to offset the economic impacts of the declining labour 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 GDP 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 United Nations (2005) projects that the demographic structure of the world – and of Asia in particular – will undergo major changes in the next few decades. The sharp demographic changes in East Asia, with mortality and fertility rates falling dramatically over the 1965-1990 period, contributed to the rapid economic growth of those times. These contributions occurred through the working-age population growing at a much faster rate than its dependent population, expanding the labour force as well as the per capita productive capacity of the East Asian economies (Bloom and Williamson, 1998). Stepping ahead to the future however, these same decreases in mortality and fertility will eventually lead to a decline in the working-age population as people retire from the workforce. These rapid demographic changes that are being observed in the East Asia and Pacific (EAP) region today and are projected to occur in the future will have similarly important impacts for economic growth, although these impacts will not be as generally positive as they have been historically.

Komine and Kabe (2009) find that Japan, with its declining total population and labour force, will soon have declining growth rates, eventually reaching near-zero economic growth in the 2040s. China, Hong Kong, 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. The annual economic growth rate of South Korea will fall below one percent after 2030, and Chinese annual economic growth will decelerate to about one percent by the 2040s. Indonesia, Malaysia, the Philippines, and Vietnam are estimated to soon follow this deceleration, although their economic growth rates will remain higher than those of China, South Korea, Hong Kong, and Singapore for longer.

The changing demographics of Asian countries will thus create labour shortages in some countries, while other Asian countries will experience large expansions in their labour force, with substantial economic impacts in all counties. A well-managed labour migration strategy within the EAP region thus has the potential to ameliorate impending labour shortages in some EAP countries, while providing an opportunity for other regional countries with excess labour to provide migrant workers that will contribute to the development of the home country through greater remittance flows.

This study examines the potential impact of increased migration on the East and South-East Asian economies, in light of these projected demographic changes. These potential impacts are analysed using a global dynamic simulation model, with migrant labour flows and

remittances used to examine the impact of migration. The global dynamic migration model is based on the Dynamic GTAP (*GDyn*) model, developed by McDougall and Ianchovichina (2001) and the *GMig2* model developed by Walmsley et al. (2007). 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 labour force changes induced by demographic transition and migration.

For the analysis, we develop a scenario that takes into account the impact of the demographic changes expected to occur in Asia over the next four decades to 2050. Population and skilled and unskilled labour forecasts are imposed exogenously, in combination with assumptions regarding growth, technological change and capital accumulation. The scenario also accounts for the impacts of the recent global financial crisis. We then allow migration in Asia to respond endogenously to the changes in wages resulting from the expected growth and demographic changes over the next four decades.

The following section will review the drivers of migration, the implications of demographic change for labour forces in the EAP, and the potential for migration to address some of the projected labour force declines in some economies. Section 3 will describe the dynamic simulation analysis framework. Section 4 analyses the results of the scenario and decomposes the impact of migration, while Section 5 concludes.

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 labour 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 labour receiving countries and to better understand the Asian context within which the mechanisms will be considered in this study. Section 2.1 will discuss the economic and socio-political drivers of migration, while Section 2.2 will discuss the impacts and implications of demographic change for economic growth and labour supply. By understanding the implications of demographic change for labour supply, and the incentive structure of international labour movements, the review of East and South-East Asian migration policy in Section 2.3 can be better understood.

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. In this context, it is widely believed that international migrants respond to the economic conditions of the home country relative to the expected conditions of the host country. At the same time, Ethier (1985) argues that while there is a large descriptive literature on labour migration, studies on the economics of labour migration are scarce, especially if compared to what has been done on international capital mobility, which constitutes the other factor of production typically considered.

From an economic perspective, migration occurs because of spatial differences in the supply and demand of labour. For example, labour receiving countries such as Canada, Australia, and New Zealand demand extra labour due to their aging populations, low birth rates, and expanding labour-intensive industries, while labour sending regions have an excess supply of labour due to high birth rates and relatively low rates of employment creation. These spatial differences are usually detected in real wage differentials between these countries, which encourage workers from low-wage countries to move to high-wage countries.

Table 1 summarizes the possible factors that trigger and/or maintain migration. The decision to migrate is not equally influenced by all these factors. In general, push and pull factors have a higher weight at the beginning of a migration flow and the social network factors become more important as the migration flow matures (Martin, 2006). Lee (1966) derived the “push-pull" migration model and explained that push factors drive people to leave their countries (i.e. lack of stable employment, low wages, increasing population, inter alia) while pull factors, impediments, and social networks, attract/deter people from potential countries of residence. Social networks facilitate the “recruitment" and adaptation of new migrants in the host country by providing or helping migrants to find job opportunities (Balan, 1992; Waldorf, 1996; Wilpert, 1992). Social networks perpetuate international migration, particularly along certain established migration corridors. For example, Munshi (2003) finds that a large network of Mexicans in the USA improves the employability of Mexican immigrants.

Table 1: Push-Pull Factors of Migration

Push Factors	Pull Factors	Impediments	Social Networks
High Unemployment	Low Unemployment	High transportation cost	Job and wage information
Excess Labour Supply	High demand for labour	Lack of shared border	Assistance to new migrants
Low income	High expected income	Different language	Established communities with similar culture
Low wages	High Wages	Border control	
Economic or political crisis	Economic stability		

Source: Aguiar (2009); Martin (2006)

Bringing the analysis of push-pull factors to Asia, Ducanes and Abello (2009) examine the demographic, economic, political, and environmental factors that could play a role in shaping future migration to and from China, Indonesia, and the Philippines. These factors are provided in Table 2. High population growth rates in the Philippines are identified as providing strong pressure for high annual out-migration, unless economic growth – and hence domestic employment opportunities – increases substantially. The situation is somewhat different for countries like China, where the population growth rates – and hence labour force growth rates – have been declining, and growth is strong, reducing incentives for outward migration.

Ducanes and Abbelo's (2009) characterization of the push-pull factors into economic, demographic, political, and environmental factors provides a valuable insight for the purposes of this analysis. The latter two factors, political and environmental forces, have historically been responsible for many large-scale movements of populations, e.g. movements of refugees out of conflict zones in Central Africa, or the displacement of rural populations in Bangladesh due to the floods of 2007. These movements, by their nature, represent the impact of idiosyncratic shocks, and are not due to decisions made by agents under normal circumstances.

In contrast, the push-pull factors of economic and demographic forces represent conditions that allow economic agents (e.g. workers) to make rational decisions within a policy environment. Economic push-pull can be interpreted very simply as the difference in potential income and employment opportunities between the home and the target destination country.

Table 2: Factors That Might Impact Future Outward Migration in China, Indonesia, and the Philippines

	Factors Encouraging Outward Migration				Factors Discouraging Outward Migration			
	Demographic	**Economic**	**Political**	**Environmental**	**Demographic**	**Economic**	**Political**	**Environmental**
China	Large migrant networks destinations	Fast rising incomes impacting on migration in medium-term; -high income inequality	Ethnic unrest in Tibet and Xinjian; undemocratic political environment	Rise in sea level due to climate change; prone to natural disasters	Low population; growth rate; continuation of one-child policy	High growth	Democratization processes likely to gain strength with growing urban middle class	n/a
Indonesia	Large migrant networks destinations	High unemployment rate;	Risks of ethnic animosities being stirred up; revival of independence movement in Irian Jaya	Rise in sea level due to climate change; prone to natural disasters	Declining population growth	Consistent economic growth in recent past	Conflict in Aceh remains dormant	n/a
Philippines	Large migrant networks destinations; high population growth; increasing number of tertiary-educated	Poor history of sustaining economic growth for long periods	Concerns about institutions; armed conflict with separatist groups in southern	Rise in sea level due to climate change; prone to natural disasters		High economic growth in past 6 years; vibrant business process outsourcing industry		n/a

Source: Reproduced from Ducanes and Abbelo (2009)

Empirical evidence suggests that workers respond to improved earnings opportunities in other locations, and that conditions in the target destination may be more important than conditions in the origin. 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 United States and Mexico have traditionally been the cause of northern migration, but the surge of undocumented migration from Mexico during the 1980's 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 United States.

Demographic push-pull factors, while considered distinct by Ducanes and Abbelo (2009), can also represent another economic force. If there is an excess supply of labour (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 labour was high.

2.2 Economic Impacts of Demographic Change

Most analyses of the coming changes in Asian labour 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, 2000; Ogawa, 2003, Gubhaju, 2008), 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 labour forces also starting to decelerate, as indicated in Table 3 (JCER, 2007). In some cases, non-ASEAN countries like India will continue to experience an expanding labour force for a few more decades. This is especially disturbing in light of what is known about the contribution of favourable 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 labour 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 labour force growth rates remain important contributors to Asian growth. Columns I and II of Table 4 demonstrate the importance of these two population variables for growth. In the case of Singapore, for example, the labour 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 South-East Asian countries become negative as a result of the demographic changes (column III, Table 4).

Policies targeting the changes to the labour 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., 2007b; Watanabe and Fujimoto, 2008). However, the impact of the latter approach is ambiguous, since policies to increase higher fertility rates may reduce female labour force participation, reducing the labour force in the short run (Bloom and Finlay, 2009). Inoguchi (2008) cites evidence from South Korea, where social policy emphasizing traditional family values - to promote a society with higher fertility - encouraged an accelerated out-migration of specific groups of women.

Table 3: Rates of percent change of labour forces of Asian countries

	Japan	China	S. Korea	H. K.	Singapore	Thailand	Malaysia	Philippines	Indonesia	Vietnam	India
1980–1985	1.2	2.8	1.9	2.4	3.0	3.1	2.8	2.6	2.3	2.9	2.4
1985–1990	1.1	2.3	3.1	0.9	3.6	2.7	4.3	2.9	3.8	2.6	2.3
1990–1995	1.2	1.4	2.2	1.6	2.5	0.7	2.9	3.2	2.4	2.5	2.0
1995–2000	0.4	1.0	1.1	1.8	3.4	1.3	3.3	2.3	2.8	2.4	1.9
2000–2005	–0.4	1.0	1.4	1.9	1.4	1.2	2.6	3.8	1.9	2.3	2.0
2005–2010	–0.1	0.8	0.8	1.2	1.4	1.1	2.4	3.1	1.8	2.1	1.8
2010–2015	–0.3	0.3	0.6	0.4	1.0	0.7	2.2	2.6	1.5	1.5	1.7
2015–2020	–0.4	0.0	0.3	–0.4	0.1	0.4	1.9	2.1	1.4	0.9	1.5
2020–2025	–0.6	–0.2	–0.3	–0.6	–0.8	0.3	1.4	1.7	1.1	0.6	1.5
2025–2030	–0.8	–0.5	–0.6	–0.5	–1.1	0.1	1.1	1.4	0.9	0.4	1.3
2030–2035	–1.1	–0.7	–0.8	–0.3	–0.9	0.1	0.8	1.2	0.6	0.2	1.1
2035–2040	–1.4	–0.9	–1.1	–0.2	–0.5	0.0	0.6	1.0	0.4	0.0	0.9
2040–2045	–1.5	–0.9	–1.3	–0.1	–0.4	–0.2	0.5	0.8	0.3	–0.4	0.7
2045–2050	–1.5	–1.1	–1.5	–0.1	–0.7	–0.3	0.4	0.6	0.1	–0.6	0.6

Source: Reproduced from JCER (2007)

Table 4: Contribution of Demographic Change to Average Economic Growth (Percentage Points)

	Contribution to Economic Growth from Growth of		
	Labour 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
South-East 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
South Asia			
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)

Given the potentially large differences in labour force growth rates between countries in East and South-East Asia, the migration of workers into countries that will soon experience declining labour forces from countries with rapidly expanding labour forces presents itself as a potential response to the coming demographic transitions. Surprisingly there has been little policy discussion in East and South-East Asia about migration as a response to demographic changes and potential labour shortages, with the possible exception of Japanese immigration reform allowing Nikkejin (migrants with Japanese ancestry, primarily from Latin America) to live and work in Japan. There have also been few studies examining the potential impacts of a migration policy that allows for movements of labour between Asian countries experiencing, or soon to experience, differences in labour demand and supply. Tyers and Shi (2007) explore the impact of such a policy, but for non-Asian countries.

The Tyers and Shi (2007) study projected substantial aging of labour forces in all regions of the world up to 2035, and declines in labour 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 labour forces by allowing for sufficient migration from the rest of the world to hold non-working age dependency ratios constant from 2000 onwards. As Table 5 indicates (reproduced from Tyers and Shi, 2007), the labour receiving countries are able to maintain high growth rates going to 2020 as a result of the large

migration in-flows, while the rest of the world experiences substantial welfare losses. Since Tyers and Shi (2007) do not take account of remittances it is possible that these substantial losses could be partially offset by remittance flows. However, in order to maintain the labour force growth rates in the North, Tyers and Shi (2007) simulated unrealistically high labour movements out of developing countries – at rates that are only computationally feasible up to 2020 – the end year of their simulation. In this paper we do not attempt to maintain the growth rates of the Asian labour-recipient economies by forcing extreme migration rates.

Table 5: Replacement Migration in Scenario Results, Percent Departure from Impacts in Baseline Scenario with No Replacement Migration

	Labour Force	Real GDP
Australia	90.6	62.8
North America	121.8	100.8
Western Europe	52.8	36.4
Central Europe & the Former Soviet Union	-45.8	-43.9
Japan	0.0	-9.2
China	-5.5	-14.8
Indonesia	-0.2	-7.3
Other East Asia	-23.3	-24.2
India	-4.6	-10.1
Other South Asia	-9.3	-11.8
South America	-9.0	-12.6
Mid-East & North Africa	-12.6	-15.1
Sub-Saharan Africa	-6.5	-8.8
Rest of World	-80.7	-65.8

Source: Reproduced from Tyers and Shi (2007).
Note: Australia, North America, and Western Europe are the only countries receiving labour to maintain base year dependency ratios.

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 alternative migration policies, both global and bilateral. This literature has predicted substantial global gains from liberalizing the movement of labour. 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-

labour incomes in the labour-receiving country are not well-captured by many statistical analyses. The 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), using global bilateral migration models and data that account for changes in non-wage factor returns, predict that greater liberalization of labour movement from the South to the North would lead to global welfare increases, with the migrant-sending, less developed countries receiving a large share of these welfare gains.

The World Bank's (2006) dynamic simulation framework analyses the global implications of a 3 percent increase in developed country labour forces over a 24 year period, with the additional workers coming from developing countries. Under such a counterfactual change in labour force, global welfare increases by USD 674 billion (at 2001 prices), with natives and new migrants in high-income countries, and in the developing countries, all benefiting. Walmsley et al. (2009) uses a comparative static bilateral global migration model (*GMig2*) to investigate the impact of lifting restrictions on the movement of labour. Quotas on skilled and unskilled labour in the developed economies are increased by 3 percent of their labour forces, with the additional labour supplied by the developing economies. The modest liberalization increases global GDP by USD 288 billion (at 2001 prices).

The findings of these studies suggest that liberalization of the movement of Asian labour has the potential to alleviate excess demand for labour and facilitate growth. Increased liberalization of migration can reduce wage and employment pressures and fill the skill gaps in the fastest growing Asian economies, while providing further opportunities to those economies in the region with high population growth rates and slower economic growth. The result is an improvement in the welfare of both sending and recipient economies.

Walmsley and Ahmed (2008) use the *GMig2* modelling framework to examine multiple counterfactual scenarios where both traditional migration destinations, as well developed East Asia countries liberalize their migration policies. Comparing liberalization by North America, Europe, and Oceania with liberalization by developed Asia, the study finds that regional liberalization seemed to have more positive effects (or less negative effects in the short run) on East and South-East Asian labour-sending economies. The study also finds that legalization of undocumented migrants within ASEAN had significant positive effects in terms of real GDP and income, particularly for Malaysia, and to a lesser extent the other economies of ASEAN, even in the short run. They suggest that intraregional policies can offer an important alternative mechanism by which Asian economies can reap some of the gains from liberalizing migration;

particularly given the reluctance of Europe and traditional migration destinations (i.e. the USA, Canada, Australia, and the UK) to open their borders. Such regionally based policies aimed at the liberalization of migration both within ASEAN and by the developed Asian economies offer potential gains in terms of real income and long-run economic growth, particularly for those countries in East and Southeast Asia.

2.3 Migration and Migration Policy in Asia

Due to the potential challenges and opportunities presented by international labour movements, historical migration and migration policy has 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 neighbouring 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 collections of studies of the history of East and South-East Asian migration and migration policy, such as Debrah (2002), Ananta and Arifin (2004), Massey and Taylor (2004), and more recently, the Asian Development Bank (2008). 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.

Migration within the EAP region has generally increased over time (Table 6). 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 have returned home.

Table 6: Percentage Change in Number of Migrants 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	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. (forthcoming)

Athukorala (2006) reviews migrant labour policies in East Asia and points out that most countries in East Asia have historically lacked well-defined migrant labour management programs. An exception is Singapore. It has had a long-standing and well-defined migrant labour policy, applying industry-specific quotas and levies on employers for hiring low-skill migrant workers, and has been able to leverage its migrant labour force to make substantial contributions to its growth. like Malaysia, Taiwan, 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 labour policies as a result. For example, Malaysia has been reforming its migrant labour policies since the 1980s, signing a series of bilateral labour supply agreements to regulate labour inflows and introducing industry and skill specific levies on employers hiring migrant workers (Kanapathy, 2004).

Table 7 provides a good snapshot of some of the key instruments being used by countries in the region. It can be seen that the primary tools of migration management appear to be trainee programs, levies, and bilateral agreements. The openness of the migration policies is often linked to the closeness of socio-political ties, such as Malaysia preferring to recruit labour from Muslim countries like Indonesia and Bangladesh, or Taiwan traditionally discouraging workers from Mainland China.

China is notably absent from this table since it is overwhelmingly a source of migrant workers for the world, and not a destination for most. Given its massive labour force, growing industries have not faced labour shortages during China's process of rapid growth over the past few decades. At the same time, labour demand in China has not been high enough to encourage

migrant workers to overcome the legal and logistical barriers to entry. This may need to change in the future as China confronts an aging population and sluggish labour force growth.

In many cases, the policies reflect a tendency towards restricting the in-migration of lower-cost low-skilled migrant workers and promoting the out-migration of higher skilled workers, as noted by Wongboosin (2003). Given the structural changes occurring in these economies and in the world as a whole, these policies may contradict a potentially advantageous flexible migrant worker policy. For example, Malaysia and the Philippines are faced with increasing demand for less-skilled workers. However, their migration policies with regard to less-skilled migrant workers are very restrictive (in terms of both the foreign worker's country of origin, and the region and sector in which he/she is permitted to work). When these policies are combined with an increase in demand, for the same workers that these policies are meant to restrict, the results are hindered growth and increases in the demand and supply of undocumented workers—a pervasive problem within Asia. Migration policy reforms that are more liberal with regard to the flow of lower skilled migrants may thus have unexpected welfare benefits for the recipient country.

Recognizing the potential benefits of more integrated labour markets, countries in both ASEAN and APEC have included discussions of labour mobility within their broader trade negotiations. APEC labour mobility policy discussions have focused primarily on greater mobility of business persons, such as through the Business Travel Card Scheme (APEC, 2010). ASEAN policy discussions have been a bit more wide ranging, as evidenced by the creation of ASEAN's Framework for Agreement on Services (AFAS). ASEAN countries have also agreed to work towards the formation of an ASEAN Economic Community by the year 2020, allowing free movements of goods and investment within its borders (Bhatnagar and Manning, 2005). However, Bhatnagar and Manning (2005) point out that the AFAS has had limited success in opening additional sectors for service delivery through the temporary movement of natural persons (Mode 4) beyond current GATS commitments, possibly due to domestic political economic forces. The study also suggests that AFAS negotiations are not expansive enough. The framework excludes unskilled workers that have dominated migrant flows from developing South-East Asia. It also excludes employment in sectors like agriculture and manufacturing, which have traditionally benefited from migrant labour in places like Hong Kong, Malaysia, and Singapore.

Table 7: Summary of Migrant Worker Policies in Selected East and South-East Asian Economies

Economy	Migrant Worker Policy
Hong Kong*	Domestic workers can be hired under two-year renewable contracts from any country except mainland China, since 1979; quotas allocated to employers for migrant workers to fill unfilled vacancies if positions cannot be filled by locals, since 1984
Japan**	The 1989 reforms of the Immigration Control Law facilitates migration of professional and skilled personnel, while maintaining the principle of not accepting unskilled migrant labour, employer sanctions introduced to discourage employment of undocumented migrants; the 1993 Technical Internship Trainee Program allows for *de facto* migrant workers in certain industries; Nikkeijin (descendants of Japanese emigrants) given access to residential status with no restriction on employment.
Malaysia*	Bilateral agreements with Indonesia, Thailand, the Philippines, Bangladesh, Vietnam, and Sri Lanka, with agreements describing skill requirements, sectors, and numbers of migrant workers to be supplied; levy on migrant workers based on skill and sector since 1991; low-skilled workers are issued annually renewable temporary employment permits with a sector-specific maximum number of years; professional/skilled workers receive passes relatively more easily.
Singapore*	Monthly levy payable by hiring agent for each migrant worker; dependency ceiling limiting ratio of migrant workers to employer, by industry; levies instituted in 1987 and raised periodically; severe penalties for undocumented workers; migrant workers can only be hired if vacancies cannot be filled by local; skilled migrant workers encouraged to apply for residency
South Korea*	Migrant workers as "trainees" and can work under a "1-year training" and "2-year employment" program since 2001; annual quota on number of trainees by industry; since 2004, an Employment Permit Scheme allows migrant workers to stay for up to 3 years and change jobs up to 3 times; the focus of the scheme is help small and medium enterprises
Taiwan*	Migrant workers viewed as means of promoting targeted industries; since 2000, employment can be of up to 3-year term; workers who return to country of origin after a 3-year term are eligible for another 3-year term
Thailand*	Migrant workers restricted to specific sectors with visas issued an annual basis; levy introduced in 1996; bilateral agreement for labour supply from Laos and Cambodia

Source: *Athukorala (2006), **Kashiwazaki and Akaha (2006)

In 2003, ASEAN member-countries agreed to begin liberalizing their labour markets by opening up certain sectors to workers from other ASEAN countries. The ASEAN Plan of Action for Cooperation on Immigration Matters also agreed to better standardize visa issuance procedures (ASEAN, 2010). However, Chiai (2006) notes that cooperation is limited on core migration issues such as orderly recruitment of migrant workers and protection of the rights of migrant workers, among other issues.

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 labour growth from international institutions over the period 2007-2050.[2] As part of this projected growth path, we simulate more liberal international migration policies that allow the labour-force shrinking Asian countries to import labour from those Asian countries where the labour-force is expanding.

3.1 Simulation Modelling

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. (2007). 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 modelled using a disequilibrium approach. *GDyn* assumes an adaptive expectations mechanism that permits errors in expectations. These errors 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 labour 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 analyse the effect of changes in the destination country's immigration policy, targeting particular migrant origin countries. The movement of labour of type *i* from region *c* to region *r* (i.e. changes in labour 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 labour 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).

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

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

$A_{i,c,r}$ 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 migrants respond to differences in 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.[3] 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 ones family.

Note that Equation (1) is calibrated on actual data and incorporates the current state of restrictions on migration in the host country.[4] Figure 1 is used to further explain this. It is assumed that demand and supply of migrants are equal and hence the labour market is in equilibrium (see Figure 1). The labour 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 (Ls=Ld). Equation (1) is the labour supply curve.

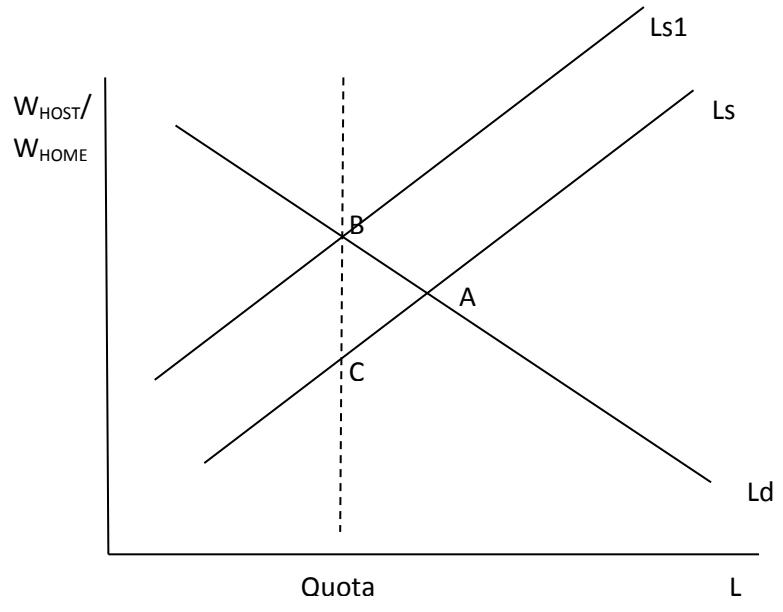
Turning now to the more likely case of restrictions on migration, the dashed line in Figure 1 is used to depict the situation where a quota (or cost to migrants, either implicit or explicit) has been applied to restrict the number of migrants. In this case migration is lower than it would be without the quota, and the wage paid by firms (Point B, determined by Ld) is much higher than the wage required by the migrant worker (Point C, determined by Ls). 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

[3] The authors also tested the model with *ESUBMIG*=0.4.
[4] Given $ESUBMIG_{i,c,r}$=1.

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.[5]

We argue that this quota reflects the current state of 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 labour forces, change and economies grow, the host economies will adjust their quotas in response to firms' demands for more labour. The resulting labour supply curve is given by Ls1, and is higher than the original supply curve (Ls). 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 labour supply curve (Ls1 in the case restrictions). The implication of this is that only changes in 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.

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



[5] 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.

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

This version of the model also includes unemployment of endowments (capital, skilled and unskilled domestic and foreign labour) through the inclusion of an elastic segment in the previously inelastic[6] labour supply curve. This is achieved through a complementarity (Elbehri and Pearson, 2005) which sets employment equal to the natural rate of employment, unless a fall in demand is sufficient to drive 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.[7]

Equation (1), which captures endogenous migration, also takes into account unemployment. 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. 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 labour force, regardless of employment status; hence this is the expected real wage given that a migrant may be faced with unemployment after their arrival. If unemployment in the host economy rises then the expected real wage falls, due to a higher probability of unemployment, and hence migration falls.

[6] 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-slopping.
[7] See Strutt and Walmsley (2010) for more details on how unemployment was incorporated.

Underlying the *GMig2Dyn* model is a database that captures both bilateral labour (GMig2 Database) and foreign ownership of capital (GDyn Database); as well as the core GTAP 7 Data Base (Narayanan and Walmsley, 2008). The GTAP 7 Data Base has a base year of 2004 and includes data for 113 countries and 57 sectors. For computational feasibility, the data base has been aggregated to 29 regions and 27 sectors listed in Tables 8 and 9. For this study, we have updated the GMig2 database to 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. (forthcoming) and the remittances data were also updated, using the IMF's balance of payments statistics on remittances and workers compensation.

Table 8: List of 29 Countries and Aggregated Regions

• Australia	• Cambodia, Lao PDR, Myanmar, Brunei Darussalam, Timor-Leste
• New Zealand	• India
• Rest of Oceania	• Bangladesh
• China	• Pakistan
• Macau, Mongolia, Democratic PR Korea	• Sri Lanka, Afghanistan, Bhutan, Maldives, Nepal
• Japan	• United States of America
• Hong Kong, China	• European Union 27 members
• Taiwan	• Russian Federation
• Republic of Korea	• Former Soviet Union
• Indonesia	• Rest of North America
• Malaysia	• Latin America
• Philippines	• Rest of Europe
• Singapore	• Middle East and North Africa
• Thailand	• Sub-Saharan Africa
• Vietnam	

Table 9: List of Aggregated Sectors

• Rice	• Electronic equipment
• Wheat	• Other machinery
• Grains and crops	• Petroleum, coal products
• Cattle and wool	• Motor vehicles and parts
• Other animals	• Chemical, rubber, plastic products
• Meat products	• Metals
• Processed rice	• Metal products
• Other Foods	• Other manufacturing
• Forestry	• Construction
• Mining and extraction	• Utilities
• Textiles	• Transport and communication
• Wearing apparel	• Business services
• Leather products	• Housing, education and health
• Wood and paper products	

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 (Table 10). 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.[8] 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.

[8] Table A1 in the Appendix displays the distribution of unskilled domestic workers by sector in the database.

Table 10: 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 Scenario

The model simulates the world economy from 2007 to 2050, under migration policies that allow labour to move freely within the EAP region in response to changes in real wages. These labour movements are in addition to, and the result of, the demographic and labour 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 labour 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 labour 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 labour forces are assumed to grow at the projected growth rate in total labour. Increases/decreases in the domestic labour supply are implemented as changes in the natural rate of population growth, while foreign labour increases are implemented through changes in migration.[9] The change in foreign labour keeps the share of migrants in the total population constant.[10] Since these labour forecasts are meant to include migration we assume that foreign labour grows at the same rate as the domestic labour force. This means that a country is willing to exogenously

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

[10] 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.

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.

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.[11]

4. Simulation Results

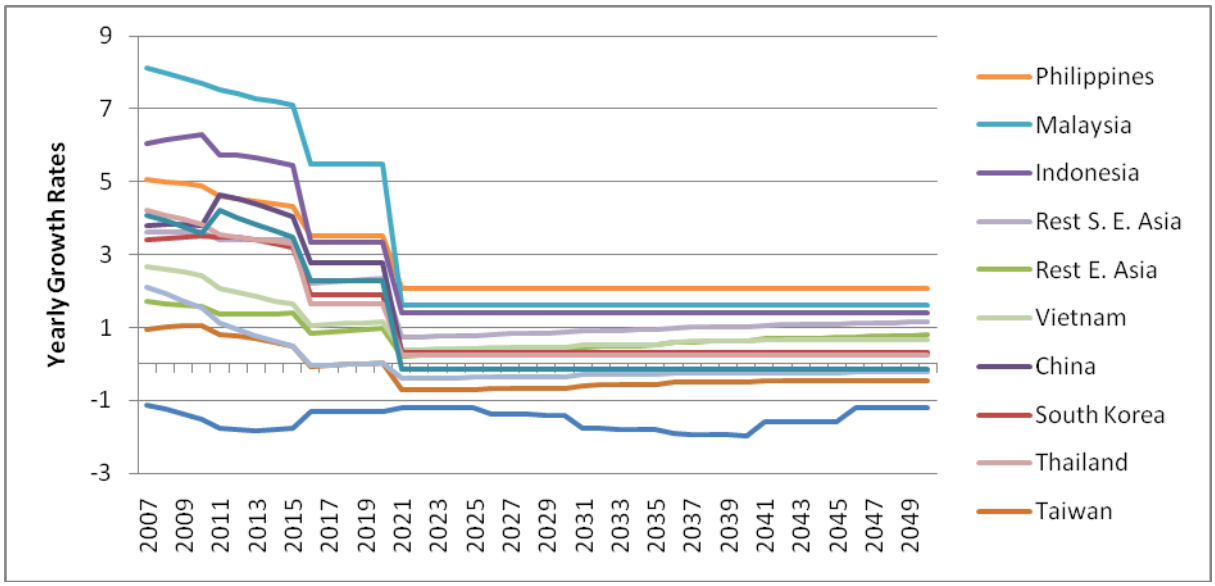
In this section we examine the results of the scenario in terms of the projected demographic changes, changes in bilateral migration in response to the changes in wages resulting from the demographics and the impact of these on the EAP economy.

4.1 Demographic Changes and Real Wages

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

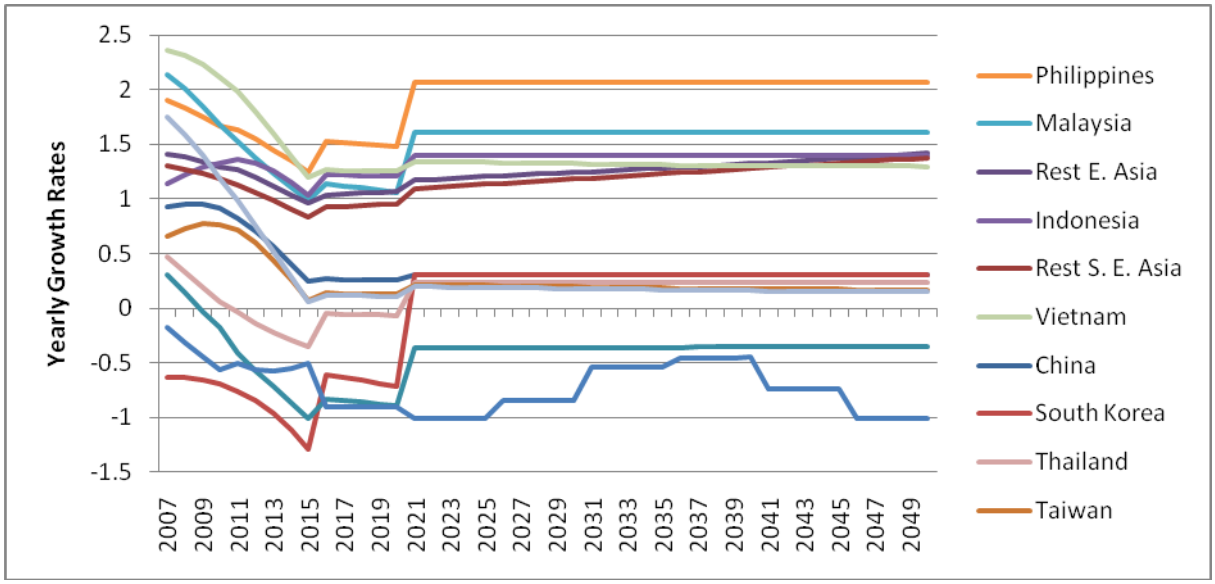
[11] The reader should therefore not interpret these large decreases in migration or return migration are large flows of people back to their home economies, instead they are migrants choosing not to migrate in the first place or to migrate elsewhere instead.

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



Source: Authors' results

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

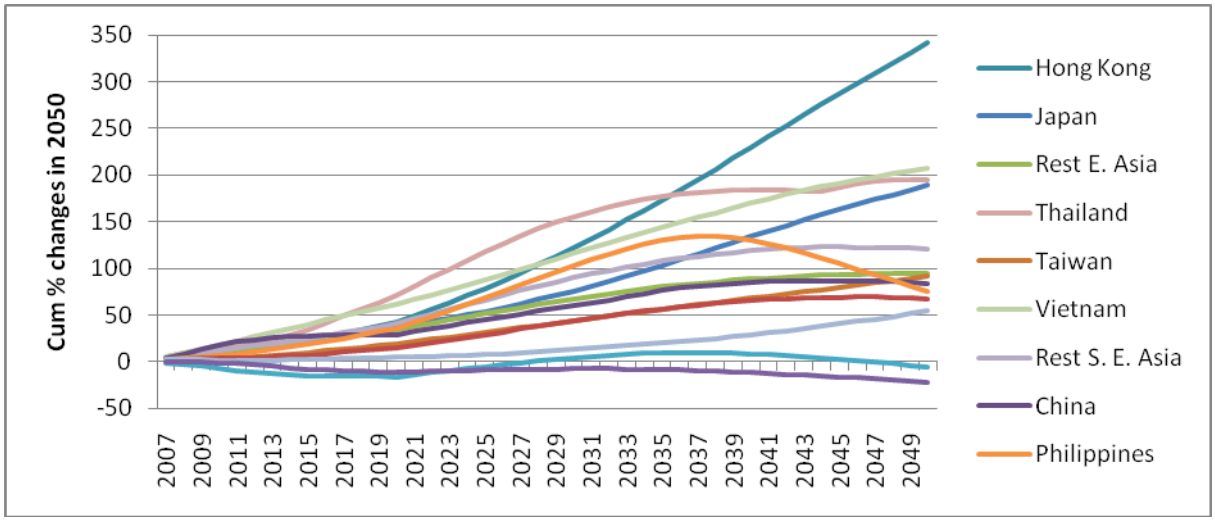


Source: Authors' results

Figures 4 and 5 show the cumulative percentage changes over time of the real factor prices of skilled and unskilled labour resulting from these forecasted demographic changes in the EAP region. Hong Kong 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 are 350% higher in 2050 than they were in 2007 for skilled workers and 600% higher for unskilled workers. The next highest

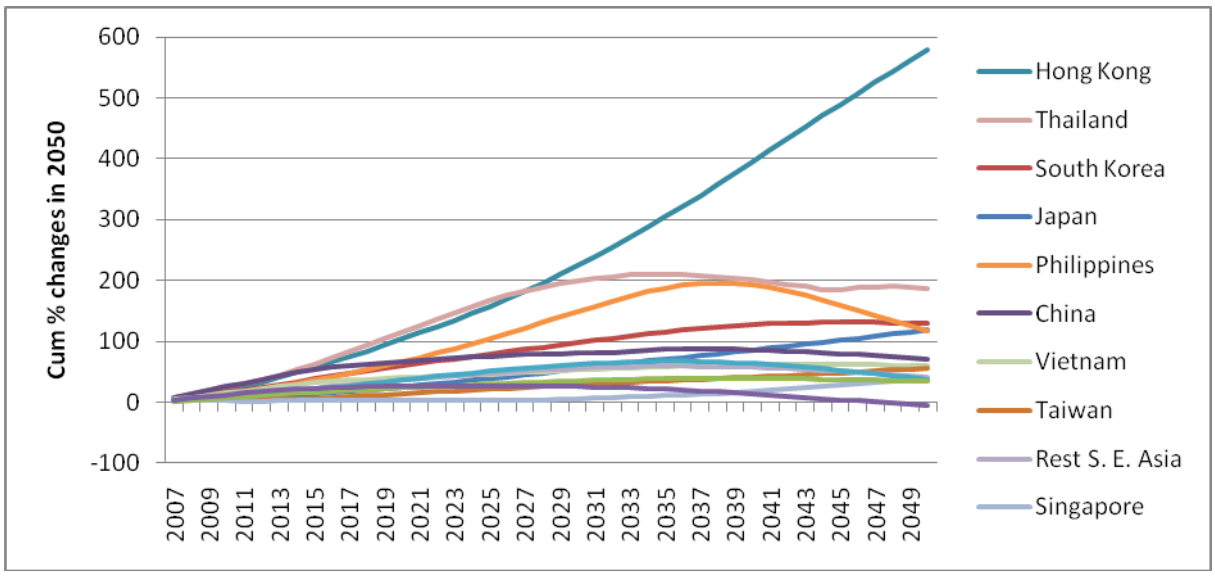
increases are in the Rest of East Asia and Thailand where real wages rise by 200% relative to 2007. As expected, the six of the seven economies – China, Hong Kong, Japan, Taiwan, Thailand, and South Korea – highlighted above for having the lowest growth in skilled and unskilled labour, are also those the economies where factor prices rise consistently over time; while the other regions experience much slower growth in real wages. The one surprise here is Singapore, where despite low/negative growth in skilled and unskilled labour, wages do not rise to the same extent as in Hong Kong or even 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 Labour Force and Migration

Table 11 presents an overview of the changes in the labour force, by skill type and by country. The total change in the labour forces are decomposed into two main components forecasts and liberal migration policies. The forecasts can be further divided into changes due to the natural rates of changes in permanent residents (births/death rates, II and III) and our assumption that migration increases with population forecasts (IV and V). The liberal migration policies component can be further divided into changes in changes in the number of migrants located in the country/region (VI and VII) and changes in permanent residents through outward or return migration (VIII and IX). The labour 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' labour 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.

Table 11: Decomposition of the Changes in Labour Force by Country between 2007 and 2050 (Millions of People)

	Total		Forecasts				Liberal Migration			
	Change in Labour 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	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[a]	1.3	-0.1	1.3	-0.1	0.00	0.00	0.00	0.00	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, so there is no impact of liberalizing migration policy.

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).

Hong Kong'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 labour forces as a result of liberal migration, with 0.95 and 1.57 million fewer workers respectively. These two countries, alongside Indonesia, the Philippines, and Singapore all receive fewer migrant workers in 2050 under the more liberal migration framework, although the impact on the labour force (in terms of people) in Indonesia and the Philippines is positive overall 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 11). The liberal migration policies also cause the return migration of people from Hong Kong and an increase in outward migration of Chinese and Malay residents.

Figures 6 and 7 compare the forecasted growth in skilled and unskilled labour with the growth in skilled and unskilled labour under more liberal migration for selected countries, respectively, over time.[12] Looking at Figure 6, this comparison highlights several interesting points.

- First, endogenous migration does not alter the growth of the labour force significantly in most economies. Only in Hong Kong, where migration is highest, does the growth rate of labour rise by just over 1%. This is because migrants are generally a small share of the labour force in most Asian economies.

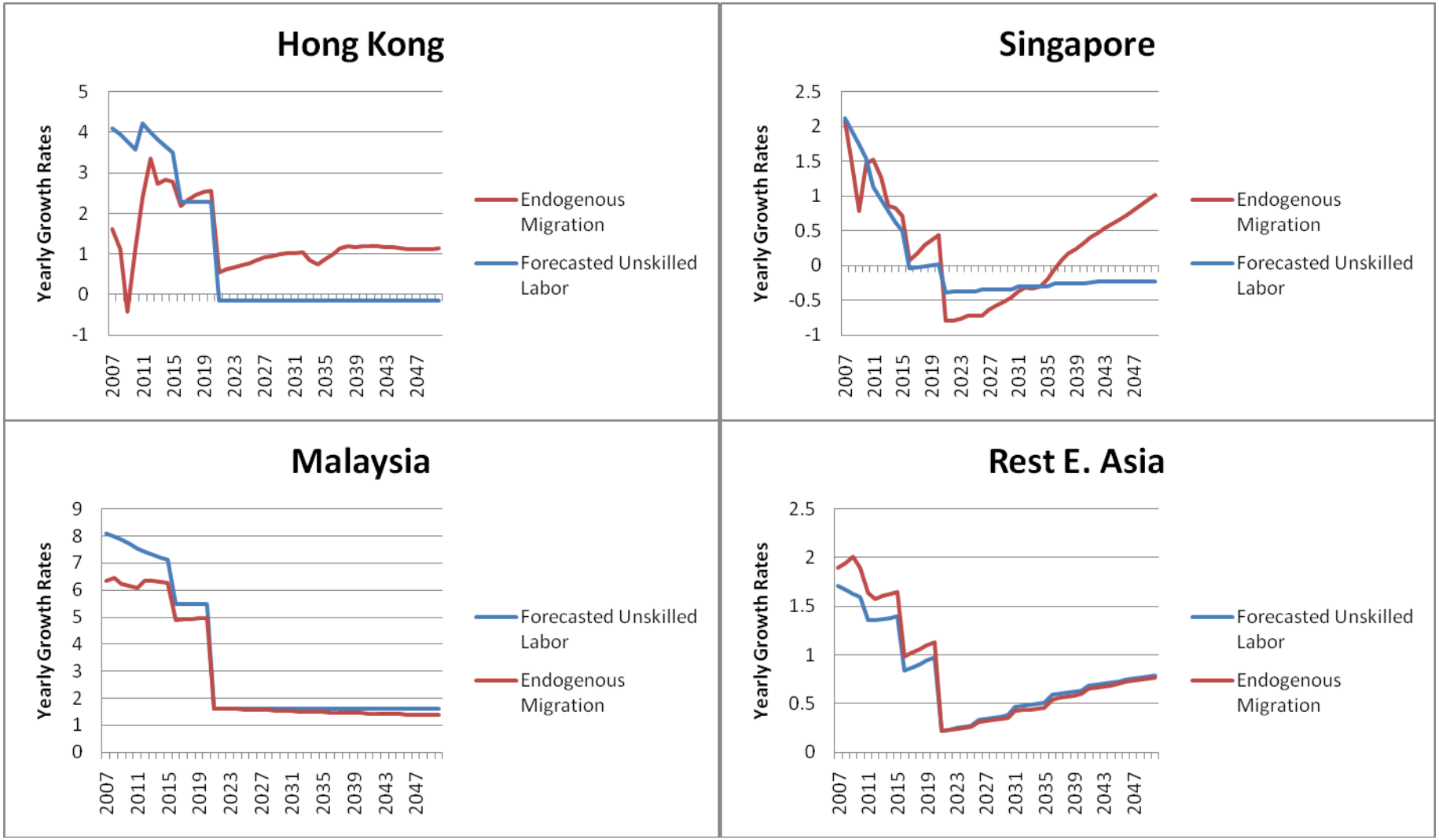
- Second, another interesting feature of endogenous migration is the extent to which migrants react to the global financial crisis. During the global financial crisis, real GDP and real wages fall, while unemployment rises. The combination of falling real wages and higher unemployment in the host economy 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. Labour growth with endogenous migration is therefore generally below forecasted labour

[12] Changes in the labour forces of all economies are provided in Table 10.

growth during the financial crisis (2007-2012) – in 2012, the number of migrants globally was 0.82 million lower than under the forecast scenario.

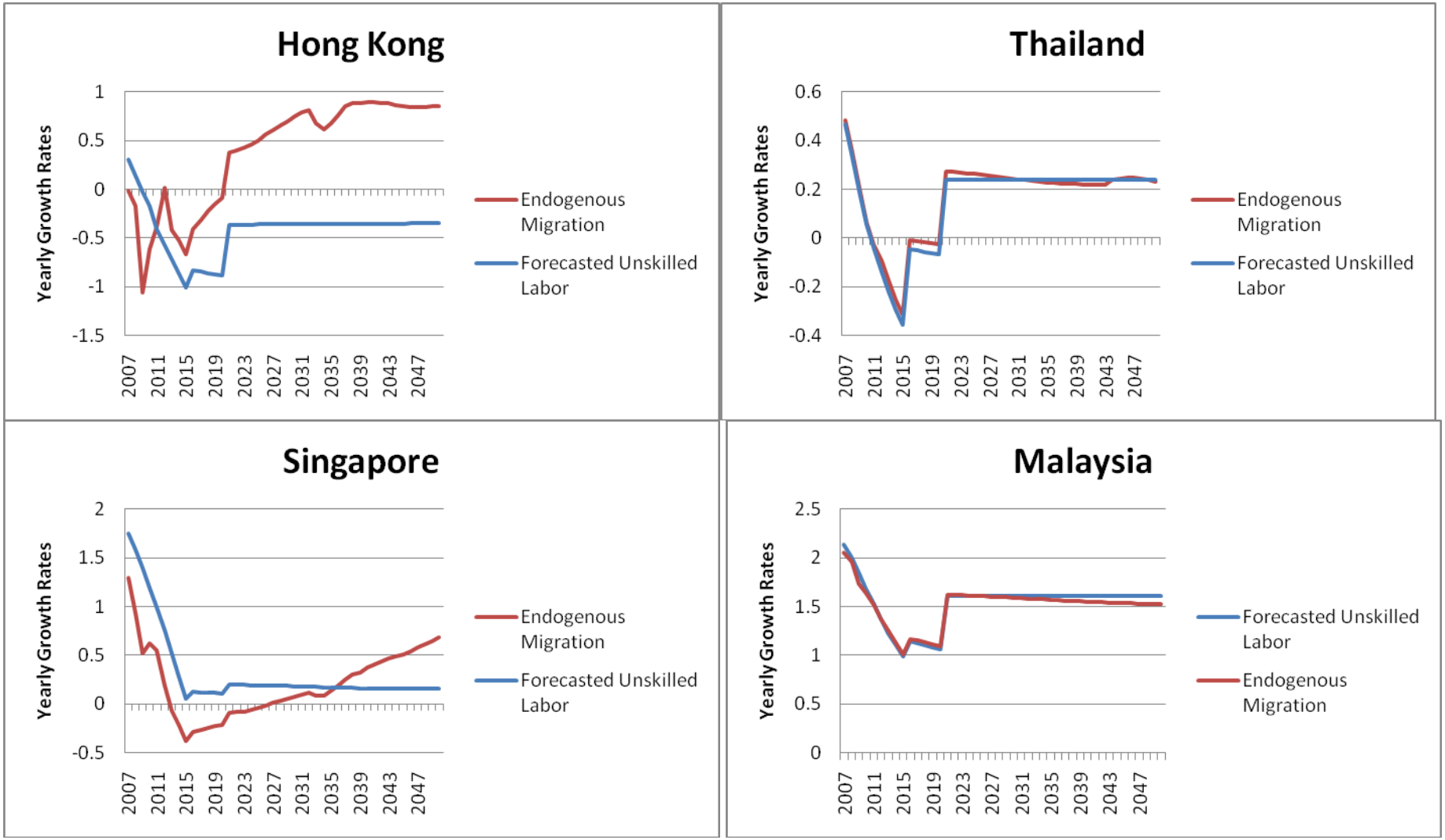
- Third, once the effects of the global financial crisis have dissipated (usually between 2012 and 2020), the demographic effects come into play and migration towards those Asian economies experiencing lacklustre population growth becomes more evident. Overall, migration due to the financial crisis is temporary and does not affect the demographic story. Figure 6 indicates that if migrants are free to move in response to wages, Hong Kong and Singapore would have mostly increasing growth rates of skilled labour 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 6: Forecasted versus Endogenous Migration Annual Growth Rates of Skilled Labour for Selected Countries



Source: Authors' results

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



Source: Authors' results

Figure 7 compares forecasted growth with endogenous growth for unskilled migrant labour, with similar conclusions to those found with skilled labour in Figure 6. The growth of unskilled labour with endogenous migration would be higher than forecasted unskilled labour for Hong Kong 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 labour relative to the forecasts until 2015. After 2015, the unskilled labour 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 labour force, Malaysia's unskilled labour force growth would be slower than originally forecasted when considering endogenous migration, albeit the differences are minimal (Figure 7).

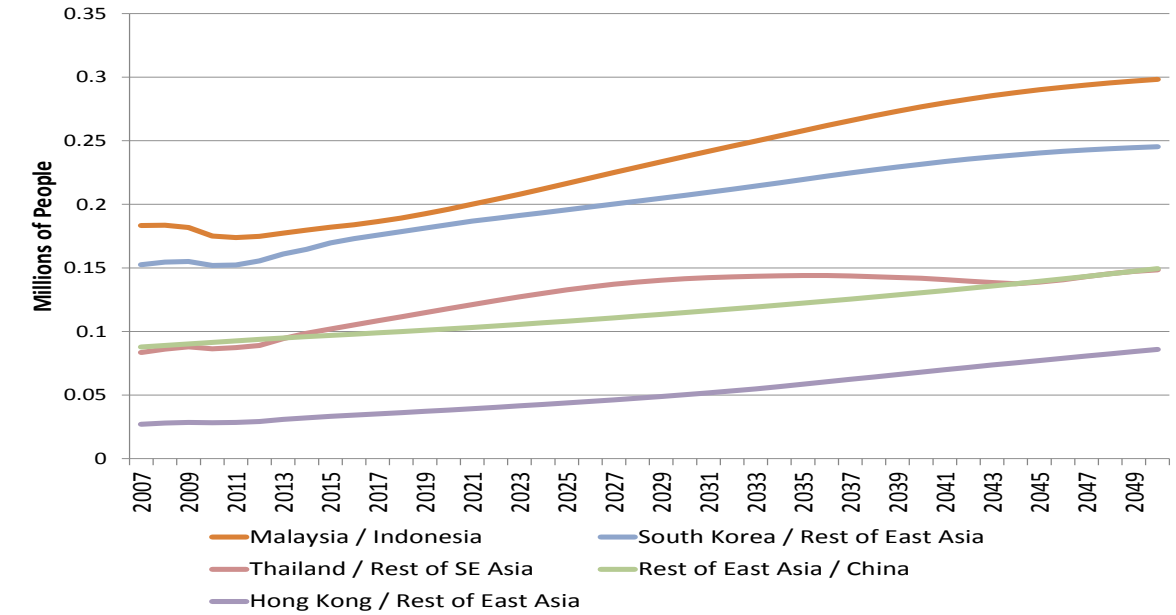
Changes in the labour force depend on the changes occurring within the bilateral migration corridors, and the relative productivities of those migrants. Figures 8A, 8B, 9A, and 9B describe the unskilled and skilled labour migration corridors that expanded or contracted the most over the period. These 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 in response to the increase in real wages in Hong Kong relative to those in Singapore and Indonesia. This is the result of the very large increases in real wages in Hong Kong and the large number of Chinese already living in Hong Kong. Migrants from Rest of East Asia are also entering Hong Kong and South Korea in response to the higher wages, while Chinese migrants also enter the Rest of East Asia[13] 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 South East 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 labour 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.

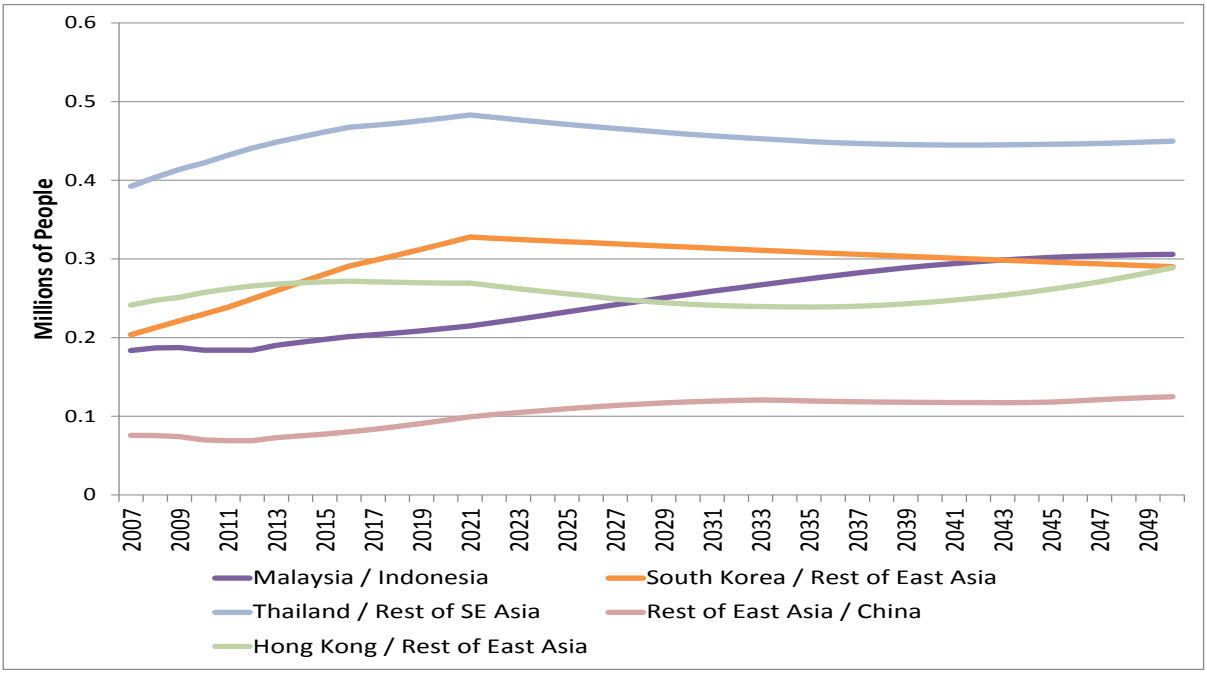
[13] The inflow of Chinese into East Asia is primarily due to the forecasted increase in the labour supply in East Asia, rather than as a result of more liberal immigration policy.
[14] Skilled real wages of Filipinos increase faster than those in Japan up until 2040 (see Figure 4).

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



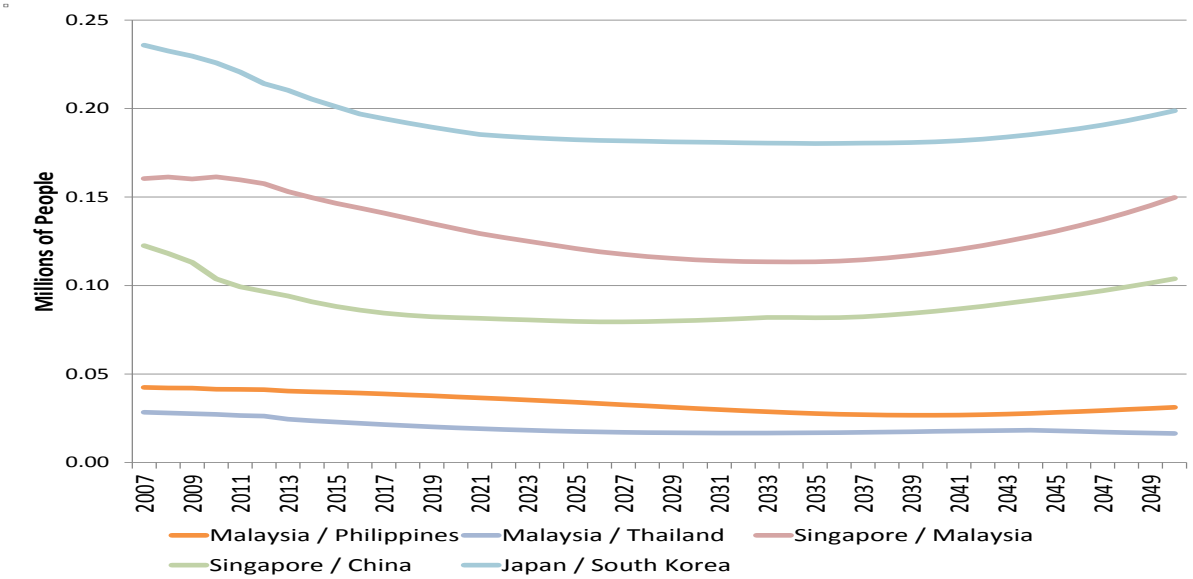
Source: Authors' results
Note a. Number of unskilled migrant workers by location/home region

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



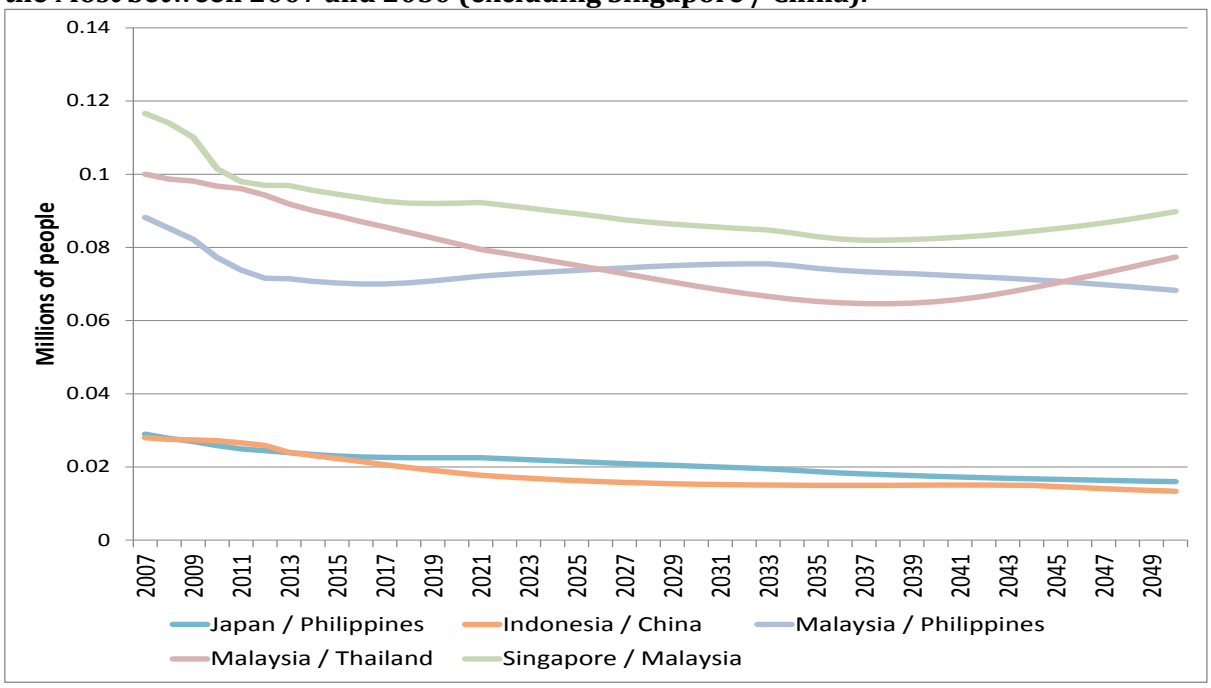
Source: Authors' results
Note: a. Number of unskilled migrant workers by location/home region

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 migration[15] and hence population due to the forecasted changes in labour;

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 12). 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 12). 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 12: 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	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	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 13 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 labour force, increased capital accumulation and technological changes. Only Hong Kong, Japan, Singapore, and Taiwan experience declining skilled and/or unskilled forecasted labour 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

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

decline in unskilled migrant workers which impact real GDP negatively (VIII outweighs VII, Table 13). Skilled migration is positive overall for all regions (XII outweighs any declines in XIII, Table 13).

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, especially given that Japan and Singapore experience similar demographic changes to Hong Kong. This lack of migration into Singapore and Japan can be attributed to the lacklustre 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) 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 labour growth to exceed forecasted growth (Figures 5 and 6) and for the beneficial effects of migration to at last be seen. In Japan, the low initial share of migrants in the labour force, lacklustre growth in real GDP, and increased competition from Hong Kong for Japan's traditional Asian migrants, make Hong Kong 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 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 labour is due to return migration, not new migrants. In general the economies in East Asia (China, Hong Kong, Japan, and South Korea) all gain from the liberalization of migration and from the increased capital accumulation that accompanies it (column III, Table 13), while those in South-East Asia (except Vietnam) experience small loses.

The small loses in South East Asia occur because of the declines in the labour force and/or capital. Changes in the labour force are driven by changes in the number of workers

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

weighted by their productivities. Decreases in the labour 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 labour forces decline with migration, despite large return migration[19], causing slight falls in real GDP. In Singapore, despite the high return migration of skilled Singaporeans, reduced capital accumulation and unskilled labour 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 labour, and decreased inward migration. Finally, Vietnam, gains due to an increase in new and returning skilled migrants.

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 labour (column II, Table 12). Capital also responds to the liberalisation 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).

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

Table 13: 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	
	Initial share			*Initial share*	*Permanent*		*Migrants*		*Initial share*	*Permanent*		*Migrants*				
		Forecasts	*Liberal*		*Forecasts*	*Liberal*	*Forecasts*	*Liberal*		*Forecasts*	*Liberal*	*Forecasts*	*Liberal*	*Forecasts*	*Forecasts*	*Liberal*
	In VA[a]	% Δ[b]	% Δ	In VA	% Δ	% Δ	% Δ	% Δ	In 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	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	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. In 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 has been weighted by considering whether it was on capital, labour or other endowments.

Table 14: 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	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	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

Table 14 provides results for some other macroeconomic variables. The real wages of unskilled and skilled labour generally respond as expected -- with real wages falling (rising) with increased (decreased) migration and labour forces in the long run. With the exception of Hong Kong, Malaysia and Singapore, most of the changes in real wages and labour 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, move 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 small[20] and the increase in investment and capital inflows caused by the migration generally outweighs the impact of remittances on the trade balance.

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

[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.

Table 15: Cumulative Changes in Sectoral Production 2007-2050 due to Forecasts and the Liberalization of Migration Policy ($US Millions)

	China		Hong Kong		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 not forecasts exogenously imposed by the model, they are determined by the model when other forecasts are incorporated.

Under more liberal migration policies, Hong Kong gains considerably as new migrants workers enter the labour 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 labour rises significantly more than skilled labour, and capital falls. This causes expansion in unskilled labour intensive industries and declines in skilled labour 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 labour. Many of the gains in Thailand are in the agricultural sector which is very intensive in unskilled migrant workers (see Table 10 and compare to Table A1 in Appendix A).

Malaysia and Singapore experience the largest declines in sectoral output. Malaysia is similar to Thailand in that the largest declines are in skilled labour and hence skill-intensive industries suffer 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 10).

5. Conclusions

The East Asia and Pacific (EAP) region will be facing major demographic changes over the next few decades. Japan is already facing a declining population growth, while China, Singapore, South Korea, and Thailand are experiencing declining total fertility rates. They will soon have aging populations, and will be followed by Indonesia, Malaysia, the Philippines, and Vietnam. These changes in population and demographic structure have very strong implications for changes in the labour force. China's labour force will begin shrinking in the 2020s, with the growth of many ASEAN labour forces decelerating. The five-year growth rates will become negative for China, Hong Kong, Singapore, and South Korea, by the 2020s, although most other countries will be spared negative labour force growth. This is especially disturbing in light of what is known about the contribution of favourable demographic changes to the high East Asian economic growth observed in the 1965-1990 period.

International migration presents itself as a mechanism by which the East and South-East Asian countries with declining labour forces can attract migrant workers from countries with higher labour force growth rates. Wage differentials and population pressures present push-pull factors that would encourage flows of workers from these relatively labour abundant

countries to the countries with current or future labour scarcity. However, current policies regarding migrant workers in the region are complex and do not generally favour free movement in response to these push-pull factors. An empirically grounded numerical simulation approach is necessary to consider the impacts of liberalization of the current regional policy regime.

This study develops such analytical framework and uses it to analyse the impact of a more liberal migration policy within the East Asia and Pacific region. Overall, we find that increased migration results in gains to both the origin and destination countries in terms of real GDP or incomes. Migration flows in this scenario results from two sources. First, we assume that the migration status quo of country is one where country migrant shares in the labour 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.

In the case of the liberal migration policy scenario, migrants respond endogenously to changes in relative wages arising from changes in demography and other economic factors, which lead to increased migration and return migration towards East Asia. With the exception of Thailand and the Philippines, all the East and South-East 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 is insufficient to completely offset the declining labour forces in the countries with shrinking populations, when migration is able to respond to the push-pull factors in the region, labour and wages adjust to reduce the economic effects of the demographic changes over the period. Capital also responds to the liberalisation of migration policies. Countries that receive more migrants experience increased production and hence increased returns to capital, thereby causing more investment and the expansion of capital over time. The combination of increased labour 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 from other sources.

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 returned 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.

Finally, inter-sectoral mobility of labour is an important assumption that the analysis makes, and that is critical to help countries reap the maximum benefits of a labour force that has expanded with migrant workers. Migration liberalization policies must thus be complemented by policies that facilitate mobility of workers between sectors, and that help migrant workers to move between industries, potentially filling gaps left behind by recent emigrants.

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Appendix A

Table A1: Distribution of Domestic Unskilled Workers across Sectors

	Manufacturing	Construction	Services	Agriculture
China*	42.29%	8.29%	32.28%	17.14%
Hong Kong*	19.53%	4.58%	74.54%	1.35%
Taiwan*	20.00%	0.00%	80.00%	0.00%
Japan*	20.12%	8.50%	69.59%	1.79%
South Korea**	27.02%	13.31%	56.55%	3.12%
Rest E. Asia*	34.34%	5.64%	51.73%	8.29%
Indonesia**	33.85%	7.98%	42.54%	15.63%
Malaysia**	62.25%	3.61%	31.72%	2.42%
Philippines**	33.15%	5.82%	41.29%	19.74%
Singapore**	28.22%	6.37%	65.19%	0.22%
Thailand**	36.41%	5.24%	41.64%	16.71%
Vietnam**	50.53%	7.73%	25.68%	16.07%
Rest S.E. Asia*	36.80%	4.48%	33.87%	24.85%

* The distribution of domestic and foreign workers is the same across sectors for these countries.
** See Table 10 for the distribution of foreign workers from these countries