Determinants of Intra-ASEAN Migration

MICHELE TUCCIO*

International labor mobility in Southeast Asia has risen drastically in recent decades and is expected to continue increasing with the establishment of the Association of Southeast Asian Nations (ASEAN) Economic Community in 2015. This paper looks at the determinants of the movement of workers and finds three structural factors that will likely drive further intra-ASEAN migration in the coming years: (i) demographic transition, (ii) large income differentials between economies, and (iii) the porosity of borders. A microfounded gravity model is estimated in order to empirically analyze the main determinants of intra-ASEAN migration in the period 1960–2000. Results suggest that the movement of migrants between Southeast Asian economies has mostly been driven by higher wages and migrant social networks in destination economies, as well as natural disasters in origin economies.

Keywords: ASEAN, determinants, international migration, push and pull factors
JEL codes: F22, J61, O15, 053

I. Introduction

In recent decades, international labor mobility has played a prominent role in shaping the socioeconomic landscape of East Asian economies. Since the 1980s, high-performing economies in the Association of Southeast Asian Nations (ASEAN) have attracted a growing diaspora of foreign workers from neighboring economies at earlier stages of their development transition (Athukorala 2006). Intra-ASEAN migration skyrocketed from 1.5 million to 6.5 million migrants between 1990 and 2013, representing almost 70% of ASEAN's total migration at the end of the review period (ILO 2014).

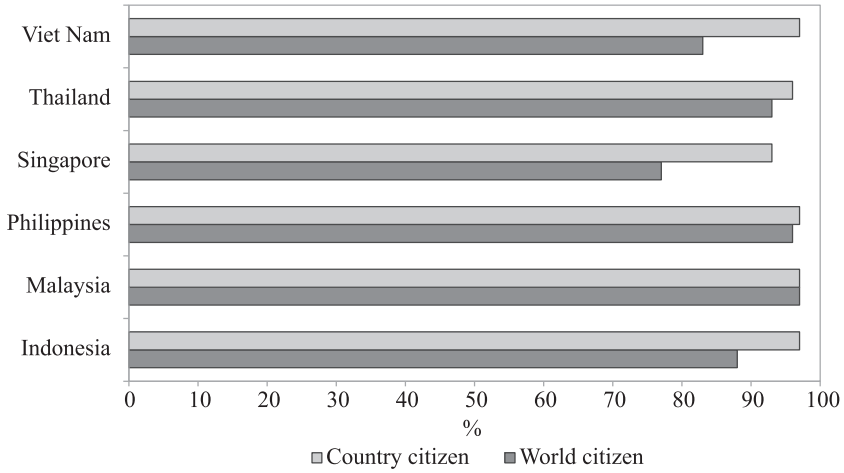
The magnitude of intra-ASEAN migration is expected to increase as the ASEAN Economic Community, which was launched in 2015, seeks not only a more integrated regional economic strategy, but also the free mobility of professionals and skilled workers within the region. As ASEAN member states enter this new integration era from very different economic starting points, the freer flow of goods and capital is likely to accelerate the movement of low-skilled workers. Firms in higher-income economies with better access to infrastructure will raise their competitiveness vis-à-vis producers in lower-income economies, thereby increasing

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Figure 1. **Share of Individuals Who Identify as Citizens of Their Country of Origin and as Citizens of the World**



Source: World Values Survey. 2014. "World Value Survey Wave 5 and Wave 6." http://www.worldvaluessurvey.org

the benefits of migration to such markets (Martin and Abella 2014). Moreover, economic differentiation across the region is progressively manifested in a mix of skill shortages and surpluses among neighboring economies, which increases the economic benefits of international mobility (Manning and Sidorenko 2007).[1]

The rise in international migration in East Asia also reflects an increasing trend in internationalization and cosmopolitanism, with more and more people identifying as citizens of the world with global rather than national ties (Nejatbakhsh 2014). Recent data from the World Values Survey suggest that the share of people who identify as citizens of the world has almost converged with the proportion of individuals who see themselves as citizens of their country of origin (Figure 1).[2] Among those ASEAN economies participating in the survey, a remarkable 89% of the population on average expressed that they considered themselves to be citizens of the world, a figure that reached as high as 96% and 97% of respondents in the Philippines and Malaysia, respectively.

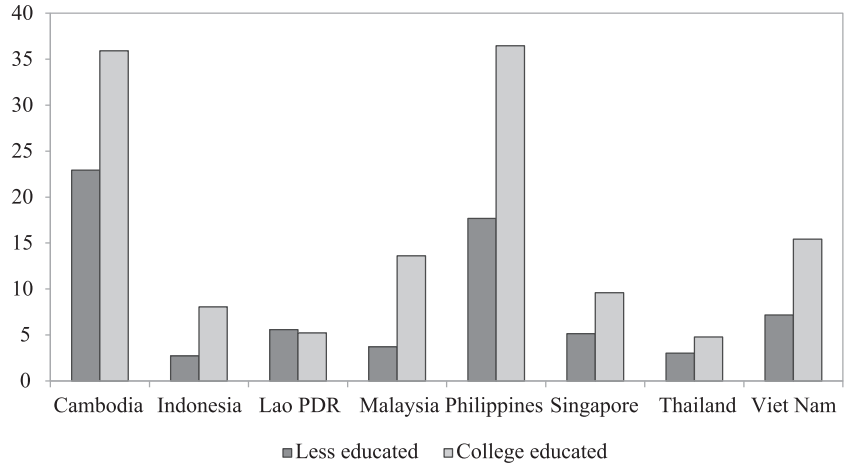
This growing sense of multiculturalism and cosmopolitanism within ASEAN is reflected in the increasing desire to migrate that has been observed in recent years at the global level. Clemens (2011) found that over 40% of the adults in the

[1] A predecessor of the ASEAN Economic Community is the 2002 ASEAN Tourism Agreement, which, among other things, introduced visa-free travel between ASEAN member states (Wong, Mistilis, and Dwyer 2011). This policy has led to the increased movement of workers across ASEAN economies. Facilitated by the removal of restrictions on tourist travel, workers have often overstayed in destination economies while working in the informal economy.

[2] Statistics provided in this paper are available for either the full set or selected subsets of ASEAN economies included in each database.

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Figure 2. **Desired Migration Rates of College-Educated and Less-Educated Individuals by Economy of Origin**



Lao PDR = Lao People's Democratic Republic.
Source: Docquier, Frederic, Giovanni Peri, and Ilse Ruyssen. 2014. "The Cross-Economy Determinants of Potential and Actual Migration." *International Migration Review* 48 (s1): S37–S99.

world's poorest quartile of economies would like to migrate if the opportunity arose. Docquier, Peri, and Ruyssen (2014) used Gallup World Poll data to identify the percentage of people in a number of economies willing to emigrate abroad if given the chance. The results reported in Figure 2 suggest that on average more than 12% of ASEAN's population over the age of 25 years old wanted to migrate in 2010.[3]

Using aggregate data from Gallup surveys for 154 economies for 2010–2012, Esipova, Ray, and Pugliese (2011) construct a Potential Net Migration Index to measure the number of adults who would like to move permanently out of an economy minus the estimated number who say they would like to move into the same economy as a proportion of the total adult population. They found that the only ASEAN economies where the net flows of migration would be positive are Singapore and Malaysia. If all individuals who aspire to move either to or from Singapore and Malaysia did so, their adult populations would increase by about 129% and 12%, respectively. The numbers of people aspiring to move in and out of Thailand would roughly balance each other out, while for the remaining ASEAN economies, unimpeded international migration would likely reduce the adult population. In particular, if all individuals wishing to migrate in and out of an economy were able

[3] There is, however, great heterogeneity across economies and education levels. College-educated individuals are twice as likely to aspire to emigrate because of the (eventual) greater payoff of moving abroad. While Indonesians and Thais have relatively lower aspirations to emigrate than those in other ASEAN economies, almost 40% of high-skilled Cambodians and Filipinos are willing to engage in cross-border migration. In the case of the Philippines, the desire to emigrate is highest among people aged 15–34 years old, residents of urban areas, and more educated individuals (McKenzie, Theoharides, and Yang 2014).

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to do so, the adult population would decline by about 31% in Cambodia, 14% in the Philippines, 9% in the Lao People's Democratic Republic (Lao PDR), and 5% each in Myanmar and Viet Nam (Esipova, Ray, and Pugliese 2014).

What is behind these large (actual and potential) movements of people? What are the determinants of international migration within ASEAN? There is need for a better understanding of the drivers of intra-ASEAN migration as labor mobility increasingly impacts Asian economies. This paper aims to tackle these critical issues by reviewing the existing literature on international migration in ASEAN and providing new insights through the analysis of data. In addition, a microfounded gravity model is borrowed from the trade literature and adapted to estimate the main push and pull factors driving cross-border migration flows.

Our findings suggest that large income and demographic differentials between ASEAN economies are likely to continue sustaining high levels of labor mobility in the years ahead. In addition, the porous borders that separate ASEAN member states might also contribute to boosting low-skilled, undocumented migration.

The remainder of the paper is structured as follows. Section II presents the linkages between individual characteristics and migration decisions. A set of structural factors that are likely to sustain intra-ASEAN migration flows is discussed in section III. Section IV introduces the specific characteristics of sending and receiving economies as key determinants. A gravity model for migration is introduced in section V and its econometric results are presented in section VI. Section VII concludes.

II. Migration Decisions and Individual Characteristics

A migrant's decision to move is influenced by both supply and demand factors. Economic and noneconomic incentives shape the supply side of international migration, encouraging individuals to engage in cross-border movements. Conversely, the need of immigrants in the destination economy as well as the immigration policies in place represent the demand side. An individual would therefore choose to migrate if the expected utility of living abroad is greater than the payoff of staying in the home economy (net of migration costs).

Individual characteristics, such as education and sex, influence both the supply and demand sides of migration. Consider a representative individual h facing the choice between staying in her home economy i or moving to a foreign economy j. The differential between wages at destination (w_j) and wages at origin (w_i) would be one of the main push factors affecting the probability of individual h to emigrate. Similarly, the unemployment rate at the destination affects the probability of finding a job after migrating. However, in both the origin and destination economies wages and unemployment rates are a function of the individual skill level (s_h) and gender (g_h). Hence, women and men, as well as low-skilled and high-skilled individuals, have different propensities to migrate based on their personal characteristics.

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Labor markets in different destinations also need different types of foreign workers. For example, most destination economies have gender-segregated labor markets, with migrant women concentrated in domestic and caregiving work and men in construction, agriculture, and trade. Since the second half of the 20th century, there has been an increasing trend of female migrants from economies such as the Philippines, Indonesia, and (more recently) Myanmar to ASEAN's fastest-growing economies of Singapore and Malaysia (Cortes and Pan 2013). With regard to female migration in the last few years, both sending and receiving economies have seen shifting patterns due to changes in the balance of power between ASEAN member states. Destination economies often grant temporary visas for women to work as domestic helpers because of the increasing number of women earning wages in the formal sector (Yeoh, Huang, and Gonzales III 1999). The magnitude of these flows is massive. For example, each year around 100,000 women emigrate from the Philippines to work as domestic helpers and caregivers (Cortes and Pan 2013), while in Singapore in 2000 there was one foreign maid in every eight households (Yeoh, Huang, and Gonzales III 1999).

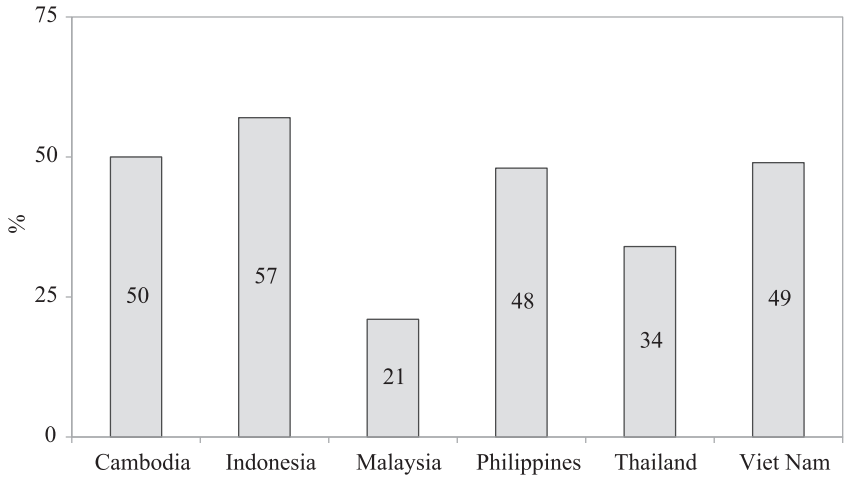
This paper uses several microlevel surveys from ASEAN economies to estimate the proportion of women among current emigrants (Figure 3).[4] Interestingly, more than half of all emigrants from Indonesia are female and approximately half of all emigrants from Cambodia and the Philippines are women. As argued by Lim and Oishi (1996), there are several distinctive features of the East Asian economic landscape that can help explain the recent feminization of migration flows. First, the supply of East Asian female migrants has been very flexible relative to men in East Asia and women in other regions of the world. East Asian women have responded rapidly to changing demand in foreign labor markets, which is partly due to low levels of discriminatory gender norms and high female labor force participation rates in their home economies. Second, ASEAN economies have seen the rise of a large immigration industry that facilitates both legal and undocumented female migration. Third, women, especially young women, are more likely than men to rely on informal social networks and chain migration, following their relatives or friends who are already employed abroad. The steady enlargement of the diasporas of Cambodians, Filipinos, and Indonesians in host economies has the effect of encouraging other women to follow.

In a similar way, the educational attainment of migrants can partly explain bilateral international migration flows. The positive or negative selection of migrants is, on one hand, due to self-selection mechanisms, and, on the other hand, due to skill-selective immigration policies in place in destination economies (Docquier and Machado 2016). In a macro perspective, economies of origin frequently specialize

[4]These surveys include the Cambodia Socioeconomic Survey (2012), Indonesia Family Life Survey (2007), Malaysia Labor Force Survey (2010), Philippines Labor Force Survey (July 2010), Thailand Socioeconomic Survey (2009), and Viet Nam Household Living Standard Survey (2012).

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Figure 3. **Share of Women among Current Working-Age Emigrants by Economy of Origin**



Sources: Cambodia National Institute of Statistics. 2012. "Cambodia Socio-Economic Survey." International Labour Organization. http://www.ilo.org/surveydata/index.php/catalog/341; RAND. 2007. "Indonesia Family Life Survey 2007." http://www.rand.org/labor/FLS/IFLS.html; Department of Statistics. 2010. "Labor Force Survey." Government of Malaysia. https://www.statistics.gov.my/index.php?r=column/ctheme&menu_id=U3VPMldoYUxzVzFaYmNkWXZteGduZz09&bul_id=NHUxTlk1czVzMGYwS29mOEc5NUtOQT09; Philippines Statistical Authority. 2010. "Labor Force Survey 2010." https://psa.gov.ph/statistics/survey/labor-force/lfs/2010; National Statistical Office. 2009. "Thailand Household Socio-Economic Survey 2009." Ministry of Information and Communications Technology. http://catalog.ihsn.org/index.php/catalog/1486; General Statistics Office. 2012. "Household Living Standard Survey 2012." Government of Viet Nam. http://www.gso.gov.vn/default_en.aspx?tabid=483&idmid=4&ItemID=13888

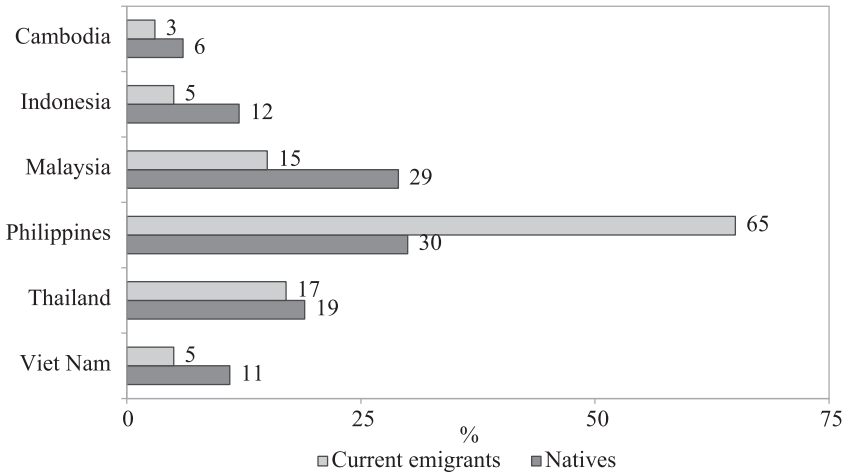
in supplying migrants with a specific skill, while labor markets in host economies often require different skills or levels of education. For example, although Singapore has typically adopted a two-pronged policy for less-skilled and professional migrant workers, the government's willingness to recruit high-skilled migrants has recently resulted in a reduction in work permits for the less skilled and a corresponding increase in the share of permits for foreign professionals (Yap 2014).

By looking at the differences in educational attainment between emigrants and natives by economy of origin, Figure 4 confirms the heterogeneous skill patterns of ASEAN emigrants.[5] Almost two-thirds of migrants from the Philippines hold a tertiary degree, while on average less than one-third of the general population is a university graduate. This positive selection of migrants is in part due to the fact that most Filipino workers migrate to Organisation for Economic Co-operation and Development economies, which require higher educational levels, and in part due to a specific government strategy. As discussed by Tullao, Conchada, and Rivera (2014), the Government of the Philippines encourages university graduates

[5]In line with previous literature, we assume that migrants' skills can be at least partially captured by their level of educational attainment. Cross-economy and/or economy-level information on the real skill levels of workers are currently not available for most economies. Among others, Beine, Bertoli, and Fernández-Huertas Moraga (2015) and McKenzie and Rapoport (2010) adopt a similar approach and we refer to them for further discussion on the issue.

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Figure 4. **Share of Working-Age Population with a University Degree by Economy of Origin**



Sources: Cambodia National Institute of Statistics. 2012. "Cambodia Socio-Economic Survey." International Labour Organization. http://www.ilo.org/surveydata/index.php/catalog/341; RAND. 2007. "Indonesia Family Life Survey 2007." http://www.rand.org/labor/FLS/IFLS.html; Department of Statistics. 2010. "Labor Force Survey." Government of Malaysia. https://www.statistics.gov.my/index.php?r=column/ctheme&menu_id=U3VPMldoYUxzVzFaYmNkWXZteGduZz09&bul_id=NHUxTlk1czVzMGYwS29mOEc5NUtOQT09; Philippines Statistical Authority. 2010. "Labor Force Survey 2010." https://psa.gov.ph/statistics/survey/labor-force/lfs/2010; National Statistical Office. 2009. "Thailand Household Socio-Economic Survey 2009." Ministry of Information and Communications Technology. http://catalog.ihsn.org/index.php/catalog/1486; General Statistics Office. 2012. "Household Living Standard Survey 2012." Government of Viet Nam. http://www.gso.gov.vn/default_en.aspx?tabid=483&idmid=4&ItemID=13888

to meet international standards by improving the quality of their education through certification measures, often in partnership with destination economies such as Canada.

Conversely, Thailand resorts to labor immigration to meet industry needs, especially for lower-skilled jobs (ADBI, ILO, and OECD 2014). This partly explains why Cambodian emigrants, who typically migrate to Thailand, appear to be negatively selected. Similarly, despite a gradual improvement in educational attainment in recent decades, Indonesian emigrants appear to be mostly unskilled and employed in the agriculture, transportation, and housekeeping sectors (Kuncoro, Damayanti, and Isfandiarni 2014).

III. Structural Determinants of Intra-ASEAN Migration

Although individual characteristics help us better understand international migration flows, not all individuals with certain characteristics decide to migrate; and even among emigrants, not everybody chooses the same destination. Some migration corridors are nearly empty while others experience large bidirectional flows. Typically, the major origin economies in ASEAN are Indonesia, Myanmar, and Viet Nam, which all have relatively lower income levels. Conversely, Malaysia,

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Table 1a. **Major Migration Corridors in ASEAN, 2000–2010**

Rank	Origin Economy	Destination Economy	Migration Flows
1	Indonesia	Malaysia	543,238
2	Malaysia	Singapore	225,661
3	Myanmar	Thailand	201,417
4	Myanmar	Malaysia	79,176
5	Viet Nam	Cambodia	43,857
6	Thailand	Cambodia	36,048
7	Viet Nam	Malaysia	35,317
8	Lao PDR	Thailand	31,721
9	Indonesia	Singapore	21,772
10	Viet Nam	Thailand	14,439

ASEAN = Association of Southeast Asian Nations, Lao PDR = Lao People's Democratic Republic.
Source: Özden, Çağlar et al. 2011. "Where on Earth Is Everybody? The Evolution of Global Bilateral Migration 1960–2000." *The World Bank Economic Review* 25 (1): 12–56.

Table 1b. **Major Migration Diasporas in ASEAN, 2010**

Rank	Origin Economy	Destination Economy	Migration Stocks
1	Indonesia	Malaysia	1,316,973
2	Malaysia	Singapore	842,899
3	Myanmar	Thailand	637,383
4	Viet Nam	Cambodia	148,516
5	Thailand	Cambodia	122,071
6	Lao PDR	Thailand	100,380
7	Myanmar	Malaysia	99,718
8	Viet Nam	Malaysia	93,215
9	Indonesia	Singapore	81,324
10	Singapore	Malaysia	61,993

ASEAN = Association of Southeast Asian Nations, Lao PDR = Lao People's Democratic Republic.
Source: Özden, Çağlar et al. 2011. "Where on Earth Is Everybody? The Evolution of Global Bilateral Migration 1960–2000." *The World Bank Economic Review* 25 (1): 12–56.

Singapore, and Thailand have absorbed most intra-ASEAN migration in recent years, given their need for workers to fill fast-growing labor markets (Tables 1a and 1b).[6] According to Martin (2007), foreigners constituted about 5% of the Thai workforce in 2007 and about 10% of the working-age population in Malaysia in 2010 (Del Carpio et al. 2015). At the top-end of the distribution lies Singapore, which represents an extreme case of labor markets in which one of every three employed persons was a foreigner in 2014 (Ministry of Manpower 2015).

[6]Tables 1a and 1b are based on the World Bank's Global Migration Database, which is a comprehensive collection of data on the stock of international migrants by country of birth and citizenship, as enumerated by population censuses, population registers, nationally representative surveys, and other official statistical sources. By definition, illegal migration is not fully taken into account in such a database. Hence, important migration routes for undocumented foreign workers may not be reported.

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In addition to individual characteristics, three main structural factors appear to be driving labor migration in ASEAN: (i) the demographic transition underway in most East Asian economies that affects the supply and demand of labor, producing additional migration opportunities and challenges; (ii) income differentials between economies, which eventually represent the greatest pull forces for migrants; (iii) the penetrability of porous borders, which can explain the high prevalence of undocumented migration in some ASEAN economies.

Much of East Asia's economic expansion in recent decades is linked to the region's demographic changes (Bloom and Finlay 2009). Since the aftermath of the Second World War, "Asia has exploited the catch-up potential with such enthusiasm that it has produced one of the fastest and most dramatic demographic transitions ever" (Bloom and Williamson 1998, 424). A sharp decline in child mortality rates has been accompanied by an increase in life expectancy and a rapid decrease in total fertility rates over the years. As a result, all ASEAN economies saw an increase in the size of their working-age population between 1965 and 2010, which further fueled already swift economic development.

We adopt a Shapley decomposition approach to quantify the extent to which aggregate economic growth in ASEAN member states has been linked to changes in the employment rate, productivity, and the demographic dividend over the last 2 decades. This technique allows for describing changes in per capita value added through the growth in each of its components (see Gutierrez et al. 2009 for a careful explanation of the methodology).[7] Using data from the ILO and the World Bank for the period 1990–2010, we find that demographic change accounted for almost one-fifth of total income growth in ASEAN member states over the last 2 decades (Figure 5).[8] In some economies, such as Singapore and Indonesia, the increase in the share of the working-age population has been even more pronounced (Ahsan et al. 2014).

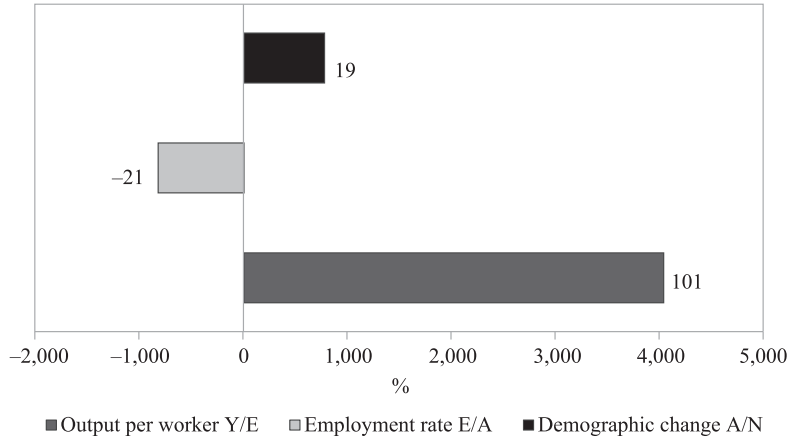
However, things are changing in East Asia. The favorable demographics that have been contributing to rapid economic growth for the past 50 years are quickly shifting. ASEAN's population is becoming older as average life expectancy increases and fertility rates decline, which will eventually lead to a contraction in relative size of the working-age population. Projections for the next 3–4 decades show labor forces in several economies shrinking dramatically, which will pose important challenges to sustaining economic growth (ILO 2014). In addition, the dependent population in the future will mainly comprise the elderly, which will

[7] Following the Shapley decomposition method, gross domestic product per capita y (aggregate value added Y divided by the total population N) can be written as $y = \frac{Y}{N} = \frac{Y}{E}\frac{E}{A}\frac{A}{N}$, where E is total employment, A is the working-age population, and N is the total population. Such a relationship can be also written as $\bar{y} = \bar{\omega} + \bar{e} + \bar{a}$, where $\bar{\omega}$ refers to changes in output per worker, $\bar{e}$ captures changes in the employed share of the working-age population, and $\bar{a}$ is the demographic change.

[8] Per capita value added comes from the World Bank's World Development Indicators and its change has been calculated as the growth rate between 1990 and 2010. Similarly, the working-age population (World Development Indicators) and the total number of employed people (ILOSTAT) are exploited to calculate changes over 2 decades.

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Figure 5. **Aggregate Productivity, Employment, and Demographic Profile of Growth in ASEAN, 1990–2010**



A = working-age population, ASEAN = Association of Southeast Asian Nations, E = total employment, N = total population, and Y = value added.
Source: World Bank. 2016. "World Development Indicators." http://data.worldbank.org/data-catalog/world-development-indicators

increase the fiscal burden of member states and crowd out investments (Ahsan et al. 2014).

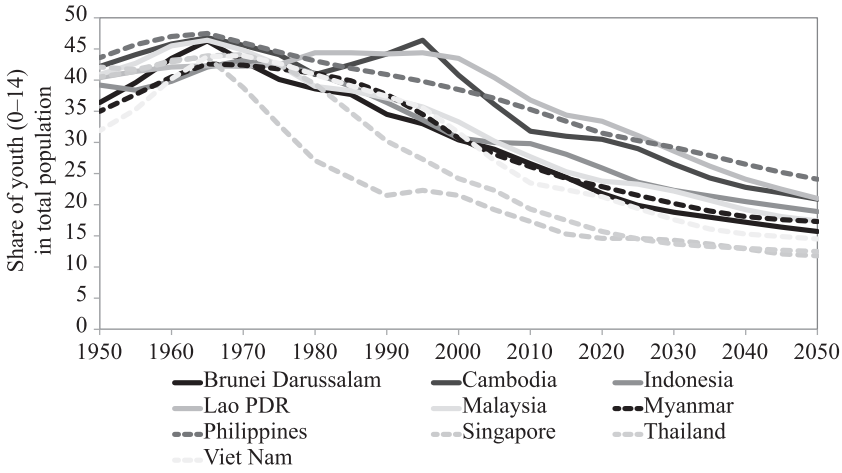
At the same time, a critical heterogeneity exists among ASEAN economies. The labor forces in Cambodia, Indonesia, the Lao PDR, and the Philippines will be powered by expanding pools of youth through 2050 (Figure 6). Singapore, Thailand, and Viet Nam are expected to have much greater dependency rates by then, with an over-65 population that will reach almost one-third of Thailand's total population in 2050 (Figure 7). As mentioned above, the population aging process is due to a mix of rising life expectancy and declining fertility rates. In the relatively higher-income economies of the region such as Singapore and Thailand, the fertility rates have fallen as low as 1.2 and 1.6, respectively, which represent some of the lowest fertility rates in the world (Özden and Testaverde 2015). Large imbalances in the age composition of the population across economies are likely to produce shortages of workers in certain economies and an abundance in other.

It appears that international migration within East Asia can serve as a relief mechanism to address demographic challenges. Given the geographic proximity to one another of economies with either older or younger populations, intra-ASEAN migration can ameliorate labor shortages in economies such as Thailand and Singapore while providing migrants from labor-abundant economies new job opportunities abroad. In sum, demographic changes have been and will continue to be one of the principal determinants of international migration in ASEAN.

The large income and wage differentials between economies are a second structural factor behind the rise of intra-ASEAN migration (World Bank 2014). In

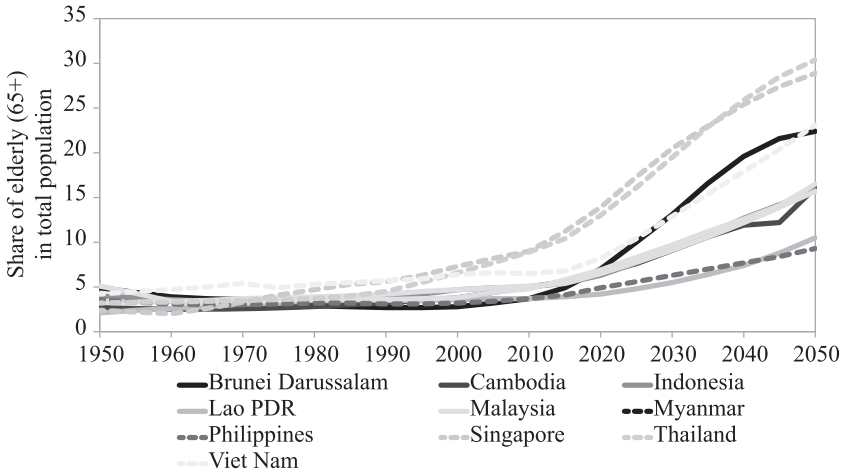
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Figure 6. **Share of Youth (0–14 Years) in the Total Population**



Lao PDR = Lao People's Democratic Republic.
Source: United Nations Department of Economic and Social Affairs. 2013. *World Population Prospects: The 2012 Revision*. New York: United Nations.

Figure 7. **Share of Elderly (65+ Years) in the Total Population**

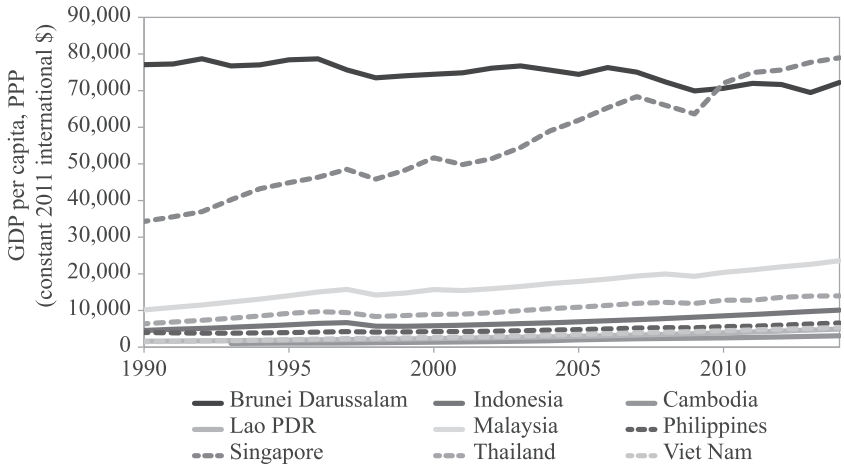


Lao PDR = Lao People's Democratic Republic.
Source: United Nations Department of Economic and Social Affairs. 2013. *World Population Prospects: The 2012 Revision*. New York: United Nations.

fact, although the average gross domestic product (GDP) per capita in ASEAN was just above $24,000 in 2014 (constant 2011 international dollars at purchasing power parity), there is a great deal of variability within the region, with average incomes

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Figure 8. **Income Differentials across ASEAN Economies**



ASEAN = Association of Southeast Asian Nations, GDP = gross domestic product, Lao PDR = Lao People's Democratic Republic, PPP = purchasing power parity.
Source: World Bank. "World Development Indicators." http://data.worldbank.org/data-catalog/world-development-indicators

as low as $3,093 in Cambodia and as high as $78,958 in Singapore (ILO 2014). The contrast is also striking if we look at average monthly wages, which range from $119 (constant 2005 prices at purchasing power parity) in the Lao PDR to $3,547 in Singapore in 2013 (ILO 2014). In addition, wages in Thailand are three times higher than in Cambodia, while wages in Malaysia are approximately three and a half times those in Indonesia.

Figure 8 shows the differences in GDP per capita within ASEAN. The relatively higher-income economies of Brunei Darussalam, Malaysia, Singapore, and Thailand (dashed lines) are all labor-receiving economies, while the relatively lower-income economies (solid lines) of Cambodia, Indonesia, the Lao PDR, the Philippines, and Viet Nam are labor-sending economies. Since potential migrants aim at maximizing their expected utility by moving abroad, they tend to move to destinations where they can improve their income and wealth. As a consequence, the large wage and unemployment differentials among ASEAN economies are likely to sustain large intraregional migration flows up to a point in the future when wages and employment rates converge across economies.

A third factor unique to intra-ASEAN migration is the porosity of its borders (Chia 2006). Facilitated by weak border controls, irregular migration has become an important feature of ASEAN labor mobility (Pempel 2006). The archipelagic structure of a portion of the region with dispersed maritime borders facilitates the undocumented movement of people (Tan and Ramakrishna 2004). The length of shared borders across remote mountainous areas makes it difficult to control and

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limit the inflow of illegal labor in other parts of the region (Bain 1998). In addition, irregular migration not only refers to those trespassing across borders without the required documents, but also includes those who overstay on tourist visas, students engaged in employment, regular migrants continuing beyond the contract period, and individuals trafficked in the sex industry (Wickramasekera 2002).

Given its very nature, quantifying the extent of irregular migration is a hard task. However, available estimates suggest that between 500,000 and 750,000 illegal migrants were residing in Thailand in 2000, mostly from neighboring Cambodia, the Lao PDR, and Myanmar. Indonesians and Filipinos represented the vast majority of the 1 million illegal migrants estimated to live in Malaysia in 1998 (Manning 2002).

Historically, irregular migration has been firstly tolerated and then sanctioned by ASEAN governments (Battistella and Asis 1998). Despite the measures put in place, illegal migration continues to be a recurrent feature of ASEAN economies. An emergency ASEAN ministerial meeting was assembled in 2015 to strengthen cooperation in the fight against irregular migration and human trafficking (ASEAN 2015).

Among the reasons for the pervasive presence of undocumented migrants in ASEAN, restrictive immigration policies that are often in contrast with labor market needs in rapidly expanding destination economies play a key role (Abella 2000). At the same time, extreme poverty and unemployment can push individuals to look for opportunities elsewhere. Political instability and repressive policies toward ethnic minorities can also encourage mobility (Wickramasekera 2002). Furthermore, the high costs of legal recruitment and the restrictive terms and conditions of employment contracts in some economies such as Malaysia have led to resistance among both employers and workers against the legal employment process for foreign workers (Kassim 2002).

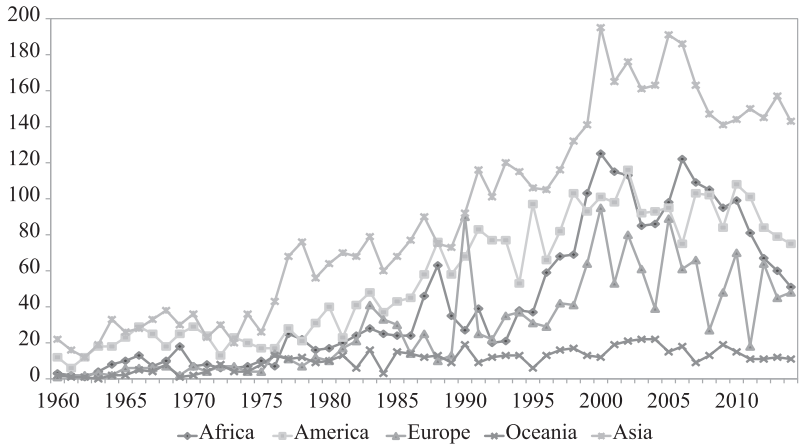
IV. The Role of Specific Features of Sending and Receiving Economies

The unique characteristics of both origin and destination economies are also important drivers of international migration in ASEAN. Among the features of origin economies that may lead individuals to engage in cross-border migration, political instability, and civil conflicts can partially explain emigration from Myanmar in recent decades. Ongoing developments are expected to shape future migration patterns, with Myanmar's political transition potentially leading to the eventual reversal of some of these previous flows (World Bank 2012).

Natural disasters and weather instabilities are also particularly relevant in the Asian context. Asia was affected by nearly half of all natural disasters between 1990 and 1999, accounting for up to 70% of all lives lost (United Nations International Strategy for Disaster Reduction 2004). Since the start of systematic reporting of disasters in the 1960s, the number of calamities reported worldwide has been steadily growing, while Asia still appears to be the continent most affected by natural

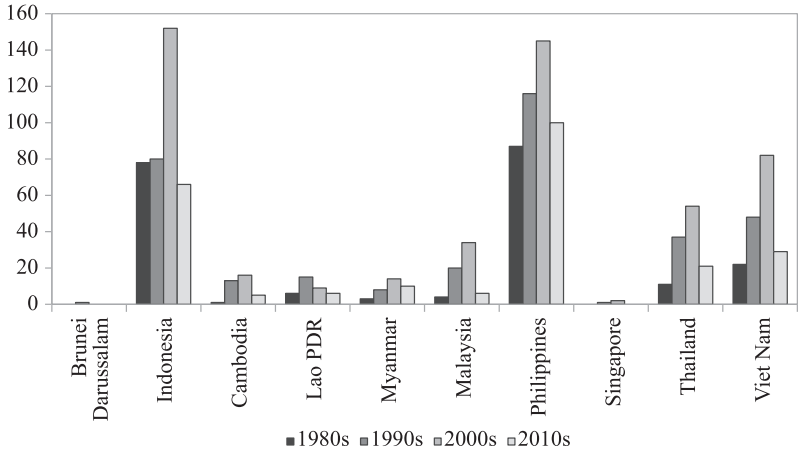
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Figure 9a. **Incidence of Natural Disasters by Continent, 1960–2014**



Source: Centre for Research on the Epidemiology of Disasters. "EM-DAT: International Disaster Database." http://www.emdat.be/database

Figure 9b. **Incidence of Natural Disasters in ASEAN, 1960–2014**



ASEAN = Association of Southeast Asian Nations.
Source: Centre for Research on the Epidemiology of Disasters. "EM-DAT: International Disaster Database." http://www.emdat.be/database

disasters—such as earthquakes, floods, volcanic eruptions, and hurricanes—with almost 200 disasters in 2000 alone (Figure 9a). Indonesia, the Philippines, Thailand, and Viet Nam appear to be the most frequently affected economies, while Brunei Darussalam, Cambodia, Malaysia, and Singapore are the least affected (Figure 9b).

Natural disasters can force people out of their homes before or immediately after an event due to the unforeseeable nature of most calamities. The impacts on the socioeconomic conditions of forced migrants often create a vicious circle, with poorer individuals being less able to cope with a disaster and ending up

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more vulnerable than before. Asian economies also suffer disproportionately from climate instability, while the persistence of natural disasters in certain areas can impede development given the continuous need to overcome the impacts of such calamities (Naik, Stigter, and Laczko 2007).

Lastly, migration costs need to be taken into account in the analysis of the main determinants of intra-ASEAN migration. The relative gain a migrant achieves by moving abroad also depends on the physical and social distance between her home economy and the destination economy (Fafchamps and Shilpi 2013). Greater geographic distance between the two economies implies higher travel costs for the initial move as well as for visits back home. In addition, the further away the origin and destination economies are from one another, the more costly it is to acquire information ex ante about the foreign labor market (Mayda 2010).

For this reason, social networks play a key role in lowering migration costs and facilitating flows by correcting for the asymmetry of information that potential migrants face (Munshi 2003, Beaman 2012). In recent decades, international migrants in Asia have relied on their networks of social capital abroad in choosing destinations (Hugo 2005). Social networks not only ease mobility but also help migrants in adjusting to and integrating with socioeconomic conditions in the receiving economy.

V. Gravity Model Analysis of Intra-ASEAN Migration

A. Methodology

As discussed in the previous sections, the choice of the optimal location for migration is given by the comparison between the utility associated with each location: an individual will choose to live where the payoff is greatest, net of any migration costs. The bilateral migration rate between two economies is thus a function of the following:

$$migration\ rate = f(income\ differential, migration\ costs)$$

In particular, migration flows are driven by the income and wage differentials between the economy of destination j and the economy of origin i, $(w_{j,t}/w_{i,t})$, as well as the physical distance between the two economies ($dist_{ij}$). Whether the economies share a common border ($cont_{ij}$) also influences the likelihood of bilateral migration, especially in ASEAN where borders are porous and less monitored. Finally, social networks, proxied by the lagged stock of migrants from economy i in economy j ($network_{ij,t-1}$), also affect mobility by lowering the monetary and psychological costs of migrating.

To empirically estimate the impact of the aforementioned drivers on bilateral migration flows within ASEAN, we adopt a gravity model approach. Borrowed from

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the trade literature, the gravity model specifies trade as a positive function of the attractive mass of two economies and a negative function of distance between them (Lewer and Van der Berg 2008). Since migration is also driven by push and pull factors, we adjust this framework in order to encompass migration flows.

Following Beine and Parsons (2015), our dependent variable is the number of migrants from economy i in economy j as a ratio of natives from i who have chosen not to migrate. Formally, let $N_{i,t}$ be the native population in economy i at time t. At each point in time, natives choose their optimal location among a set of possible foreign destinations and their own home economy. Let $N_{ij,t}$ be the size of the native population of economy i moving to the optimal destination j and let $N_{ii,t}$ be the size of the native population of economy i deciding to stay in their home economy i. The bilateral migration rate between i and j is thus given by $N_{ij,t}/N_{ii,t}$.

B. Data

In order to compute $N_{ij,t}$, we exploit the World Bank's Global Migration Database, which includes bilateral migration data for 226 economies over the period 1960–2000 (see Özden et al. 2011 for a detailed description of the data set). Since information is provided on migration stocks for each decade, we compute migration flows from origin economy i to destination economy j as the difference in migration stocks between two contiguous decades:[9]

$$N_{ij,t} = stock_{ij,t} - stock_{ij,t-1}$$

To recover $N_{ii,t}$ (the native population choosing not to migrate), we subtract from the United Nations' *World Population Prospects* data the total number of immigrants in origin economy i, which in turn is calculated from the migration data as $\sum_{j=1}^{J} stock_{ji,t}$. Our main specification will therefore be

$$\ln\left(\frac{N_{ij,t}}{N_{ii,t}}\right) = \alpha_0 + \alpha_1 \ln\left(\frac{w_{j,t}}{w_{i,t}}\right) + \alpha_2 \ln\left(dist_{ij}\right) + \alpha_3 cont_{ij} + \alpha_4 \ln\left(network_{ij,t-1}\right) + \gamma_i + \gamma_j + \gamma_t + \varepsilon_{ij,t}$$

where time-invariant characteristics of the origin and destination economies are captured by γ_i and γ_j, respectively, and time fixed effects are γ_t. Income differential is measured as the ratio between destination and origin economy per capita GDP.

[9]This second-best procedure will unavoidably result in negative flows as well (migration stocks declining over time). This may be due to migrants returning home, moving to a third economy, or dying. Thus, in constructing this measure, we assume that both deaths and return migration are small relative to net flows and we set negative flows equal to 0 (Beine, Bertoli, and Fernández-Huertas Moraga 2015). As argued by Beine, Docquier, and Özden (2011), even though this procedure may be suboptimal, it provides a fairly accurate picture of migratory movements during the period and it has become the standard approach in cross-economy studies on international migration (see Bertoli and Fernández-Huertas Moraga 2015, Beine and Parsons 2015, and Maurel and Tuccio 2016, among others).

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Data are taken from the version 8.1 of the Penn World Table (Feenstra, Inklaar, and Timmer 2015).[10] Distance (bilateral distance between the largest city in each of the two economies weighted by the population share of each city in the economy's total population) and contiguity (a dummy variable equal to 1 if the origin and destination economies share a common border) are taken from the CEPII's Gravity Dataset (Head, Mayer, and Ries 2010). Social networks are included to account for diaspora effects and they are measured as the stock of migrants from origin economy i in destination economy j at the beginning of the decade (data from the World Bank's Global Migration Database).

In addition, we augment the above specification by including the share of economy i's population aged 15–29 years $\left(youth_{i,t}\right)$ in order to capture demographic push factors in the origin economy (Mayda 2010). A larger share of youth at the origin implies more new entrants in the labor market at time t, thereby reducing employment opportunities at home and increasing the payoff of moving abroad in search of employment. The youth bulge is particularly relevant for ASEAN economies such as Indonesia and Myanmar where almost one in every three individuals was between the ages of 15 and 29 years old in 2000. Annual data on the youth population comes from the United Nations' World Population Prospects data. We compute decennial intervals in order to match the time structure of the World Bank's Global Migration Database.

Because of the importance of calamities in driving migration flows in ASEAN, we also include the aggregate number of natural disasters (e.g., earthquakes, tsunamis, hurricanes, and volcanic eruptions) by origin economy in each decade as an additional determinant. Information derives from the EM-DAT Database produced by the Centre for Research on the Epidemiology of Disasters. Finally, we introduce interaction terms between a dummy variable (with a value of 1 if the economy of origin i is an ASEAN member state) and each migration determinant in order to test whether ASEAN economies behave differently than the rest of the world.

After putting together information from all of the aforementioned sources, we come up with a data set covering 157 economies for the period 1960–2000. All ASEAN member states are included in the analysis except for Myanmar.[11]

VI. Econometric Results

Results are presented in Table 2. Column 1 shows the naïve estimation where the dependent variable is the bilateral migration rate as constructed above

[10] Although unemployment rates in both origin and destination economies are a major determinant in cross-economy migration, a lack of historical data for the entire sample of economies does not allow the inclusion of unemployment among the regressors.

[11] The lack of available data for Myanmar is a problem that needs to be addressed by policy makers.

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Table 2. **Gravity Model of International Migration, 1960–2000**

	(1)	(2)	(3)
Income differential	0.044	0.044	0.105
	(2.68)***	(2.68)***	(3.94)***
Income differential × ASEAN	0.162	0.161	0.276
	(5.62)***	(5.60)***	(6.45)***
Distance	−0.470	−0.470	−0.504
	(26.51)***	(26.51)***	(19.59)***
Distance × ASEAN	0.028	0.030	−0.181
	(0.45)	(0.48)	(2.02)**
Contiguity	0.454	0.454	0.166
	(3.16)***	(3.16)***	(0.87)
Contiguity × ASEAN	0.000	−0.005	0.997
	(0.00)	(0.01)	(1.57)
Social networks	0.296	0.296	0.274
	(44.55)***	(44.54)***	(29.88)***
Social networks × ASEAN	0.051	0.052	0.029
	(2.48)**	(2.54)**	(1.15)
Share of youth at origin		0.027	−0.339
		(0.23)	(1.32)
Share of youth at origin × ASEAN		0.448	0.612
		(1.38)	(0.87)
Natural disasters at origin			0.214
			(3.53)***
Natural disasters at origin × ASEAN			0.282
			(2.38)**
ASEAN	−2.221	−1.639	−0.123
	(3.75)***	(2.16)**	(0.10)
N	70,926	70,926	34,674

ASEAN = Association of Southeast Asian Nations.
Note: ***, **, and * represent 1%, 5%, and 10% significance levels, respectively.
Sources: Migration data come from Özden, Çağlar et al. 2011. "Where on Earth Is Everybody? The Evolution of Global Bilateral Migration 1960–2000." *The World Bank Economic Review* 25 (1): 12–56; gross domestic product per capita data come from Feenstra, Robert C., Robert Inklaar, and Marcel P. Timmer. 2015. "The Next Generation of the Penn World Table." *The American Economic Review* 105 (10): 3150–82; distance and common border dummies come from Head, Keith, Thierry Mayer, and John Ries. 2010. "The Erosion of Colonial Trade Linkages After Independence." *Journal of International Economics* 81 (1): 1–14; population data come from United Nations Department of Economic and Social Affairs. 2013. *World Population Prospects: The 2012 Revision*. New York: United Nations; and information on natural disasters is taken from Centre for Research on the Epidemiology of Disasters. "EM-DAT: International Disaster Database." http://www.emdat.be/database

$\left(\ln\left(\frac{N_{ij,t}}{N_{ii,t}}\right)\right)$. Income differentials appear to be significantly and positively affecting international migration, meaning that larger differentials between GDP per capita in origin and destination economies attract more migrants. This relationship is particularly important for ASEAN's origin economies, whose coefficient is almost 5 times larger than the coefficient for the rest of the world.

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Physical distance between two economies plays a significant negative role in shaping migration flows, increasing migration costs and information asymmetry. On the other hand, sharing a common border is positively correlated with greater migration rates, although this effect does not seem to be particularly different for ASEAN economies than for the rest of the world. Finally, social networks in destination economies have the expected positive and significant sign since they reduce migration costs and encourage mobility. Also, as anticipated, this effect is particularly relevant for ASEAN migrants, who have been shown to rely heavily on relatives and friends abroad when engaging in the migration process (Hugo 2005).

Contrary to expectations, the population share of youth (15–29 years old) in the origin economy did not appear to have any effect on migration rates between 1960 and 2000 (Column 2). Perhaps this relationship is stronger today than it was in the past as the youth bulge was previously less of an issue given more widespread labor opportunities prior to the global financial crisis. On the other hand, natural disasters in origin economies appear to have a significant effect as a push factor of emigrants abroad. The effect is particularly important in the ASEAN economies, overall twice as large (Column 3).

In sum, this simple empirical analysis using bilateral migration data confirms that income differentials between origin and destination economies are a key driver of international migration in ASEAN economies. Similarly, migration costs appear to matter as well, with higher costs reducing the likelihood of engaging in cross-border movements. Finally, as expected, natural disasters are an important push factor globally and especially in ASEAN.

VII. Conclusions

This paper identified the main determinants of intraregional migration in ASEAN. The findings suggest that migration flows are likely to increase in the next few decades as demographic changes bring imbalances across economies that will require mobility in order to fill the consequent labor shortages. In addition, large income and wage differentials across economies will continue to play an important role in attracting migrants as long as income inequalities persist across the region. On the other side, porous borders will continue to encourage low-skilled, poor workers to migrate toward higher-income economies.

In order to achieve ASEAN's objective of creating a more thriving and inclusive community, it is necessary for governments to take measures to liberalize and regularize intraregional labor mobility. As stressed by Martin and Abella (2014), the challenge will be for ASEAN economies to open their doors to low-skilled migrants. This would reduce the magnitude of irregular cross-border movements and eliminate the cost advantages enjoyed by those firms who illegally employ such migrants over competing employers who do not.

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*ADB recognizes "Hong Kong" as Hong Kong, China.

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