Migration, Trade and Local Labor Market:

Is Complementarity Strong within ASEAN?

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Abstract

In recent times the Asia-Pacific stands out as the world's most economically dynamic region with veritable economic opportunities for both labor and capital. Recent estimates by the UNDESA (2013) claims that there are 30 million migrant workers in the region. A considerable number of migrants are women and the economic impacts both at the source and destinations are varied and complex. This paper intends to look into the migration patterns in the ASEAN region as part of the larger issues centering the socio-cultural integration within AEC and its economic transactions with the rest of the world via two related questions. First, for developing countries in general, trade patterns, stock of skilled and unskilled emigrants, and capital mobility critically influence rates of emigration. I wish to investigate if trade and net migration from a specific country within the ASEAN are complements or substitutes? The empirical verification is preceded by a short analytical exercise, where we show that trade in goods and services, capital flow and migration may display complementarity or substitutability depending on skill and type of capital movements. ASEAN is fairly well known for high growth and as a capital-magnet for the rest of the world, and yet, such analysis has been largely neglected. Second, an estimate of the composite impact of labor migration demands a clear understanding of socio-economic factors in source countries that includes enrollment in higher education, labor force participation by male and female, as controls for isolating the expected relationship between trade and migration.

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5. Acknowledgements

Abbreviations

ASEAN- Association of South East Asian Nations

ILO – International Labor Office

Executive Summary

The Association of Southeast Asian Nations (ASEAN) was established in Thailand on 8 August 1967 with the signing of the ASEAN Declaration. By 1999, the Association had reached its current size of ten Member States, encompassing Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. As far as mobility of skilled and unskilled workers are concerned, among the members, Brunei Darussalam, Malaysia, Singapore, and Thailand are viewed as countries of destination, whereas Cambodia,

Indonesia, Lao PDR, Myanmar, the Philippines, and Vietnam are viewed as countries of origin, in general. We will see that preconceived trends are far from deterministic in nature.

Migration of workers is not confined within the boundaries of these nations only. As far as the larger and more visible migration pattern in Asia is concerned, a large pull factor operates in the Middle East. However, since 1990, migration of relatively unskilled workers from the southern source countries to Kuwait and Qatar went down; the rate of entry into Saudi Arabia dropped while that to USA and Canada went up. The pattern is equally compelling for Indonesia and the Philippines, where flow to Middle-Eastern countries that employ unskilled and semi-skilled workers mainly, fell. This may have to do with the first Gulf-war, but the pattern did not substantially reverse since. It may also be an outcome of internal policy changes, where trade liberalization undertaken by these countries (and the developing countries in general which constitute major source countries for international migration) may have adversely affected the skilled workers of these source countries more than the unskilled workers, thereby inducing them to emigrate in larger numbers. Asymmetric impact of trade reforms on the pattern of emigration of skilled and unskilled workers, thus, may be a plausible explanation. This paper focuses largely on this relationship.

Studying the emigration patterns of skilled and unskilled workers is also important for another reason. Inward remittance is useful for relaxing the financial constraint for potential migrants in addition to usual enhancement in consumption of durable and non-durable goods. At the same time, it is now documented by several sources that migrants either on their own or through migrant networks, send large amounts of capital meant for investments in source countries. It is possible that the purpose of capital movements originate from variations in skill types: the skilled are more likely to invest directly in the source country, whereas the relatively unskilled are more likely to remit for livelihood support of the non-migrant family.

The effect of trade liberalization on domestic wages (that might lead to the push factor behind emigration), however, holds the centre stage in explaining possible relations. The second

discussion engages with the substitutability between emigration of skilled and unskilled workers regardless of the policy shock that triggers such emigrations. *Asymmetric* changes in skilled and unskilled wages due to trade policy shocks offer the underlying rational. Emigration of skilled workers induced by fall in their domestic wage following trade or labor market reform is shown to raise the unskilled wage and thus create disincentive for unskilled workers to emigrate. This substitutability result, in fact, explains why trade liberalization fosters emigration of skilled workers whereas discourages emigration of unskilled workers. For the empirical results, we do use data on male and female labor force participation in a given country to see if the substitutability axiom is upheld for a group of ASEAN countries. While it should not be treated as analogous, nevertheless, labor force participation across males and females for a country may give a rough approximation of skill movements within the region. The overall relationship is found to be complementary for each country in question, such that trade reform raises the net emigration rates. We derive this relationship when also controlling for several factors including public debt, enrolment in tertiary education and labor force participation by male and female workers in each country.

Main Text

1.   Introduction

Several studies show that international trade and migration of labor are complements rather than substitutes, at least in the short run (viz. Schiff, 1994; Marjit and Beladi, 2002; Schiff, 2006; Narayan and Smyth, 2006; Kugler and Rapoport, 2011, etc). In general, this implies that trade liberalization will temporarily lead to more migration, not less, and create a short-run migration hump. The available literature puts forward at least three plausible explanations for a positive relation between the two. First, by creating new employment in migrant-sending countries, trade liberalization provides families with a means to finance international migration, which they could not afford otherwise. Secondly, following trade reforms, with sectors showing specificity in factor usage there would be some economic costs involved in switching resources from one sector to another. This would cause some transitional unemployment and therefore encourage more workers to emigrate. Finally, if (and in reality, it is) the most protected import-competing sector is labor intensive, then trade liberalization renders labor unemployed and might engender migrant flow to other sectors and other countries.

Therefore, in the aftermath of a trade reform, the short run complementarity between trade and migration will cause an increase in migration above the usual quasi-concave trend line.[1] Conversely, in the long-run substitutability between trade and migration will cause the hump to slide down. Importantly however, most of these studies provide fairly little information on how the migration pattern shapes across skill types.

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[1] See Acharyya and Kar (2014, Chapter 5) for a detailed review.

This paper investigates if the relation is also compelling for the ASEAN countries. In particular, we study *if* the expansion of trade within ASEAN has also led to greater mobility of workers. In addition, we will try to focus on how the relatively more skilled migrants behave under the circumstances as compared to migrants with low education or skill. It is important to remember that education is often not a good predictor of skill and job market matching of workers. Nevertheless, we offer a limited amount of observations on migration patterns of skilled labor vis-à-vis unskilled labor for a select number of countries. In order to explore the empirical relationship between trade and labor migration, we incorporate several country-specific features that are likely to generate pull or push factors and explain the evolving patterns in the region. In many cases the pull or the push factor may be substantially strong and in turn influenced by a number of country-specific factors. Using British panel data, Rabe and Taylor (2012) for example show that workers migrate on the basis of expected wage, employment opportunities and housing prices prevalent at the intended location. These are pull factors. Individual characteristics observed (with unobserved heterogeneity corrected for) at the source matter very little. Fafchamps and Shilpi (2013) use the Nepal Living Standard survey to show that migrants prefer less variation in terms of ethnic background of groups at the destination; prefer high density areas with more public amenities and feel comfortable in places where many speak their native languages. Compared to these, a number of studies show that lack of opportunities, or political and religious persecution influences emigration much more than the characteristics of the destinations. The continuing Syria to Europe migration (asylum seekers/refugee movements) is an example of the push

factor amounting to forced migration.[2] The following figure offers a schematic

description of the expected patterns in migration over time consequent on trade

liberalization at the source. If the trade reform is initiated in period 0, there is a rise in

migration in the next few years and the pattern continues for nearly one and half decades.

After the initial surge, the effect dies down and in the process saves long run unwanted

migration.

Figure I. Migration Trajectories over Time

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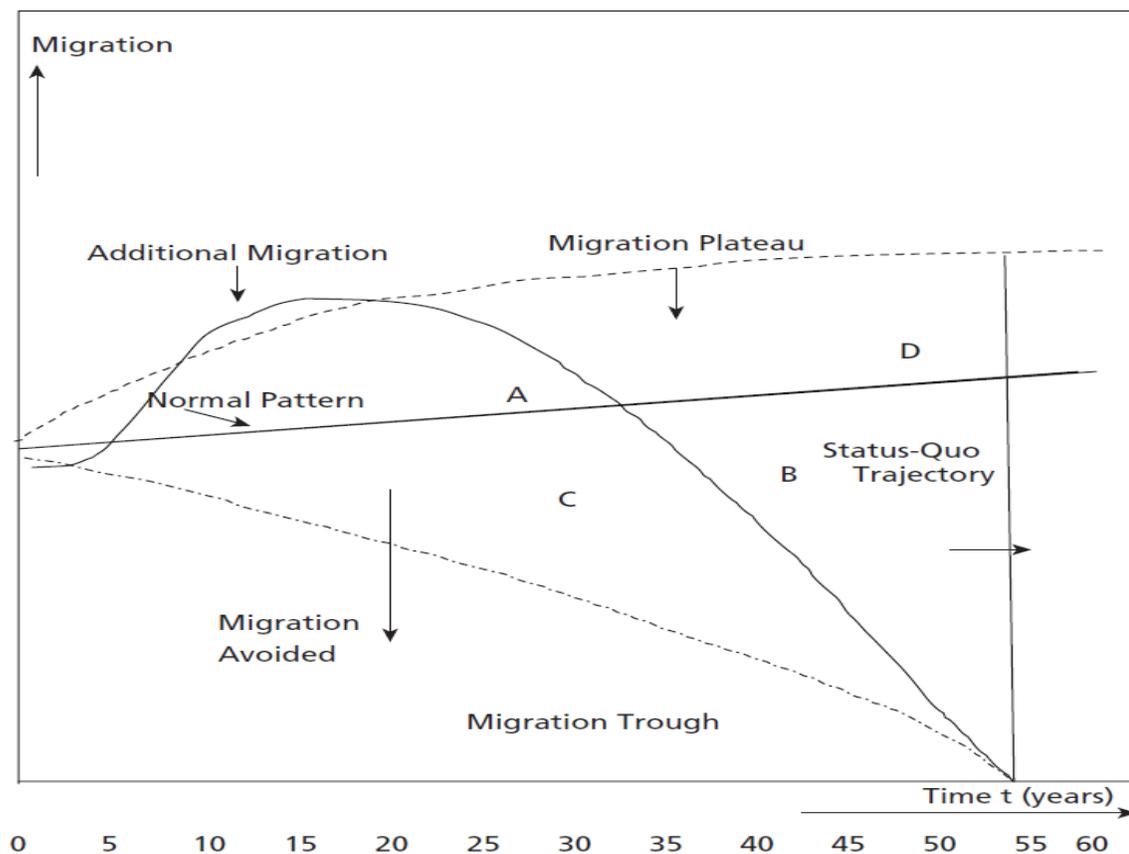
[2] See also Docquier and Rapoport (2007, 2012) for elegant surveys.

One important consideration in the formulation of the problem is that skill of migrant workers plays an important role in the choice of migration and how it responds to changes in the patterns of trade, but not accommodated in most analysis. If skill distribution is accommodated, the consequent pattern may undergo significant revision. Indeed, there is some apprehension (see Gois, 2015) that migration to the 10-member ASEAN region sometimes qualify as 'irregular' migration comprising largely of women working in the domestic and other sectors and not being treated as part of the typical workforce engaged in the manufacturing and service sectors. This may have to do with the distribution of skill across migrant cohorts, largely. As acknowledgment to an important issue such as this, the ASEAN countries adopted an Agreement on the Promotion and Protection of the Rights of Workers (2012) through an initiative taken up by the Law Reform Commission of Thailand. It is understood that the agreement harbors a broader vision in the sense that it should be applicable to *all workers* while recognizing the equal status of migrant workers, particularly those engaged in care-giving and domestic work. Negotiations have focused around building consensus among the ASEAN member countries on each article of the draft. The ASEAN Agreement on the Rights of All Workers was finalized during the AFML 2015, held in October 2015. The recent developments therefore allow us to look deeper into the causes behind the observed migration patterns. A related issue that is of importance to policymakers in the region is whether the observed migration trends are welfare enhancing for the destination and/or source countries. On the one hand, if more skilled migrants join the workforce of a given country, the productivity and output should improve. On the other hand, since there may be complementarity within migrant groups by skill types, relatively unskilled migrants

may follow skilled migrants with very different implications for the labor market and for the development trajectories. Interestingly, we keep open the issue of complementarity between skill types to empirical verification, because it is also possible that skill migration precludes unskilled migration and *vice versa*.

Thus, section 2 offers a brief analytical background (section 2.1) to understand the relationship between trade and migration patterns across skill types. This is accompanied by further motivation on observed patterns of migration from the ASEAN source countries and for some countries we also offer the skill distribution of migrants (section 2.2). The observations are limited by availability of cross-country skill-specific data on migrant workers. Note that, we are not dealing with cases of mass migration in this paper, such that the decision to migrate whether owing to push factor originating from trade reform or pull factors operating at the destination, are important at an individual level only. Section 3 obtains the impact of trade and other country-specific control variables on net inflow of migrants for specific countries belonging to ASEAN. Section 4 concludes.

2.   Theory and Observations

The Association of Southeast Asian Nations (ASEAN) was established in Thailand on 8 August 1967 with the signing of the ASEAN Declaration. By 1999, the Association had reached its current size of ten Member States, encompassing Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. Among the members, Brunei Darussalam, Malaysia, Singapore, and Thailand are viewed as countries of destination, whereas Cambodia, Indonesia, Lao PDR, Myanmar, the Philippines, and Vietnam are viewed as countries of

origin, in general. We will see that preconceived trends are far from deterministic in nature.

Migration of workers is certainly not confined within the boundaries of these nations only. As far as the larger and more visible migration pattern in Asia is concerned, a large pull factor operates in the Middle East. However, since 1990, migration of relatively unskilled workers from India to Kuwait and Qatar went down; the rate of entry into Saudi Arabia dropped while that to USA and Canada went up. The pattern is also true for Indonesia and the Philippines, where flow to Middle-Eastern countries that employ unskilled and semi-skilled workers mainly, fell. This may have to do with the first Gulf-war, but the pattern did not substantially reverse since. It may also be an outcome of internal policy changes, where trade liberalization undertaken by these countries (and the developing countries in general which constitute major source countries for international migration) may have adversely affected the skilled workers of these source countries more than the unskilled workers, thereby inducing them to emigrate in larger numbers. Asymmetric impact of trade reforms on the pattern of emigration of skilled and unskilled workers, thus, may be a plausible explanation. The short theoretical model we discuss next deals with such asymmetric impact. It is not available in the related literature.

Studying the emigration patterns of skilled and unskilled workers is also important for another reason. Inward remittance is useful for relaxing the financial constraint for potential migrants in addition to usual enhancement in consumption of durable and non-durable goods. Mueller and Sharif (2011) use a propensity score matching approach to show that remittances received from internal migrants in India cast

positive and significant influence on school attendance of teens. At the same time, it is now documented by several sources that migrants either on their own or through migrant networks, send large amounts of capital meant for investments in source countries. It is possible that the purpose of capital movements originate from variations in skill types: the skilled are more likely to invest directly in the source country (viz. Taylor, 2006) [3], whereas the relatively unskilled are more likely to remit for livelihood support of the non-migrant family.

Motivated by these observed asymmetric patterns of emigration by workers of different skill and implications thereof, this paper highlights two contrasting but related relationships in the context of a small open economy with specific factor production structure *a' la* Jones (1971). We discuss the complementarity between trade liberalization and emigration of skilled workers, where the substitutability between trade liberalization and emigration of unskilled workers is at the core. The effect of trade liberalization on domestic wages (that might lead to the push factor behind emigration), however, holds the centre stage in explaining possible relations. Subsequently, we engage with the substitutability between emigration of skilled and unskilled workers regardless of the policy shock that triggers such emigrations. *Asymmetric* changes in skilled and unskilled wages due to policy shocks offer the underlying rational. Emigration of skilled workers induced by fall in their domestic wage following trade or labor market reform is shown to raise the unskilled wage and thus create disincentive for unskilled workers to emigrate.

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[3]These statements do not imply that skilled do not send remittances at all and likewise for investments by the unskilled. In fact, for unskilled households, part of the remittance receipts is spent on education and durable assets, which may be treated as investments. Notwithstanding, consumption of wage goods out of remittances by relatively unskilled households and pure capital market transactions by relatively skilled emigrants are quite significant (viz. Acharyya and Kar, 2005, describe skill composition of Indian emigrants and remittance to non-remittance transfers).

This substitutability result, in fact, explains why trade liberalization fosters emigration of skilled workers whereas discourages emigration of unskilled workers. For the same reason, policies like emigration tax (or a cap on immigration of workers of a particular skill s may be imposed by the destination country) are shown to have an asymmetric impact on the pattern of emigration.

We analyze potentially different outcomes with regard to asymmetric emigration patterns for small open economies in general. We assume production of skill-specific import competing good and an unskilled-labor-specific export good under competitive markets. This analytical structure is however not directly put up for empirical investigation in this paper, primarily owing to lack of data of skill-specific emigration levels and flow of capital across countries. The relationship between capital movements and labor movements is presently shelved for future attention. Notwithstanding, for the empirical section as we shall discuss shortly, we do use data on male and female labor force participation in a given country to see if the substitutability axiom is upheld for a group of ASEAN countries. While it should not be treated as analogous, nevertheless, labor force participation across males and females for a country may give a rough approximation of skill movements within the region.

2.1   *A Brief Analytical Model*

As far as the analytical formulation is concerned we consider capital as a homogeneous input into production by both sectors. The import competing good is initially protected by an *ad valorem* tariff. Rates of emigration of skilled and unskilled workers are endogenously determined, which depend on domestic wages relative to

wages in the destination country and the cost of migration, which varies with the stock of migrants in the destination country. To exemplify these results, we consider three policies that may potentially influence emigration from the source country: trade liberalization, emigration tax and remittance as a form of capital inflow. We shall focus principally on the relation between trade and emigration for the empirical portion, leaving the other two policy shocks for future attention. We argue that in each case the relation works through a crucial complementarity between existing stock of migrants and would-be-migrants. First, we discuss a possible interaction between skilled and unskilled emigration patterns and then consider these policies as sources of comparative static changes. We begin with an exogenous outflow of workers.

Let us consider an initial equilibrium with factor prices and output levels for a small open economy consisting of skilled workers engaged in the import competing sector and (relatively) unskilled workers engaged in the export sector. When more unskilled workers emigrate so that less of them work in the domestic economy, the excess demand for unskilled labor raises its domestic wage and thus raises the unit labor cost in the export sector. Given the world price of this good, producers experience losses and accordingly exit from this sector. The industry output contracts so that the demand for unskilled labor adjusts to the reduced supply due to emigration, which mitigates the initial wage increase to some extent. At the same time, contraction of output of this good releases some capital and depresses its economy-wide rate of return, thereby making up losses for producers arising due to the rise in unit labor cost. The exit of firms from the export sector continues till the decline in the rate of return to capital is just sufficient to make the production of the export good break even. The rise in the wage rental ratio in

the export sector induces remaining producers to adopt relatively capital-intensive techniques of production, which depresses the demand for labor and mitigates the initial rise in the unskilled wage further. But this subsequent technique effect is second order small and does not pull down the wage at the new equilibrium.

On the other hand, the capital released from the export sector creates scope for an expansion of production of the import-competing sector. But this requires additional skilled labor, which is a specific factor in this sector. The additional demand for skilled labor also comes from the new firms that enter this sector being attracted by profit opportunity consequent upon the decline in unit capital cost. The skilled wage thus rises, which along with decline in the rate of return to capital makes production techniques of incumbent firms and new entrants more capital intensive. This technique effect in the import-competing sector makes available the required skilled labor for expansion of output of this good for the incumbent firms and for the new entrants. In sum, an increase in the rate of emigration of unskilled workers raises both the unskilled and the skilled wage. For analogous reasons, an increase in the rate of emigration of skilled workers raises both the unskilled and the skilled wage. The production patterns adjust to these shocks endogenously. The results presented in this

Secondly, as the mainstay of this paper, consider tariff liberalization in the source country. A tariff reduction lowers the incentive for migration among the skilled while raising it among the unskilled workers. This asymmetric impact on emigration pattern changes wages further. This must create newer incentives and disincentives for emigration and this cycle continues until the final changes in the emigration levels settle in. The final change in emigration is a magnification of the initial decline in emigration of

skilled workers and rise in the emigration of unskilled workers. Intuitively, if trade liberalization in the country allows skill biased technological change and hence improvement of skilled wage, skilled workers may be less inclined to emigrate. Conversely, if the unskilled workers suffer vis-à-vis skilled workers in the labor market, the rate of emigration may increase in the post liberalization period. Result 1 summarizes these.

> *Result 1:* *If emigration is sensitive to domestic wages, a tariff reduction in the import competing sector lowers skilled emigration but raises unskilled emigration.*

Here, as local wages change with emigration a tariff reduction unambiguously lowers emigration of the skilled workers. A reversal of the effect on skilled emigrants is due to the fact that tariff reduction raises skilled wage at home and thus works as a disincentive towards emigration. This also highlights the role of push factor relative to pull factor in the migration decision. We will test this hypothesis of substitutability between trade and migration (skill difference cannot be ascertained owing to lack of observations) in general with the help of an empirical model in section 3. We offer some graphical patterns of migration to further motivate this issue.

2.2. *Country-specific Migration within ASEAN*

In order to offer initial observations on the patterns of migration, a number of graphical expositions (Figures A.1 – A.9) delineate the flow to and from a select group of ASEAN countries. However, it should be noted that the statistics for migration and

capital movements between ASEAN countries are not particularly well developed, nor readily accessible. The data for international trade in goods and services is quite steadily available for a long time period, however. We consider decadal flow of migrants from major source countries in ASEAN arriving in other countries within the region, in order to observe if the trade and factor flows are strong within these countries and whether they display a pattern. Indeed, the tables offered in section 3 covers a period between 1990 and 2012, with fairly few entries on the flow in and flow out of migrant workers, but substantial data on the extent of international trade. However, in our effort to understand how much of net inflow of workers is affected by trade in goods and services, we are limited by the frequency of migration statistics for this region. Nevertheless, these results do explain some degree of mobility as functions of the flow of goods and services within ASEAN. The skill-specific graphs accommodate migration for all potential destinations from countries within ASEAN. For example, a large number of skilled and semi-skilled workers from the Philippines, Vietnam, Singapore, etc. regularly migrate out to the US and the European countries. It is also well known that the north-south trade is much stronger compared to trade within the south countries for reasons substantially discussed in the related literature. However, we sidestep the north-south trade and factor mobility issues presently in order to focus only within-ASEAN flow of goods and workers.

For example, Figure 1 shows that a large number of workers originating in Malaysia work in Singapore and in terms of numbers, the flow around 2000 (the data is for decadal movements from source to various destinations) has been close to 750,000. The accumulated decadal stock of such permanent residents in Singapore is close to 0.8 million or roughly 15% of the population of Singapore. Apart from that a large number of

migrants from Malaysia also live and work in Brunei and Hong Kong. Similarly, figure 2 suggests that a significant number of workers from Vietnam live and work in Cambodia, the Philippines and Indonesia. For Thailand (figure 3) approximately 100,000 migrants have moved to Cambodia in 2000 following much lower numbers in the eighties and nineties.

Figure 1. Migrant Origin-Malaysia

Source: ILO-ASEAN Database, ILO

Figure 2. Migrant Origin - Vietnam
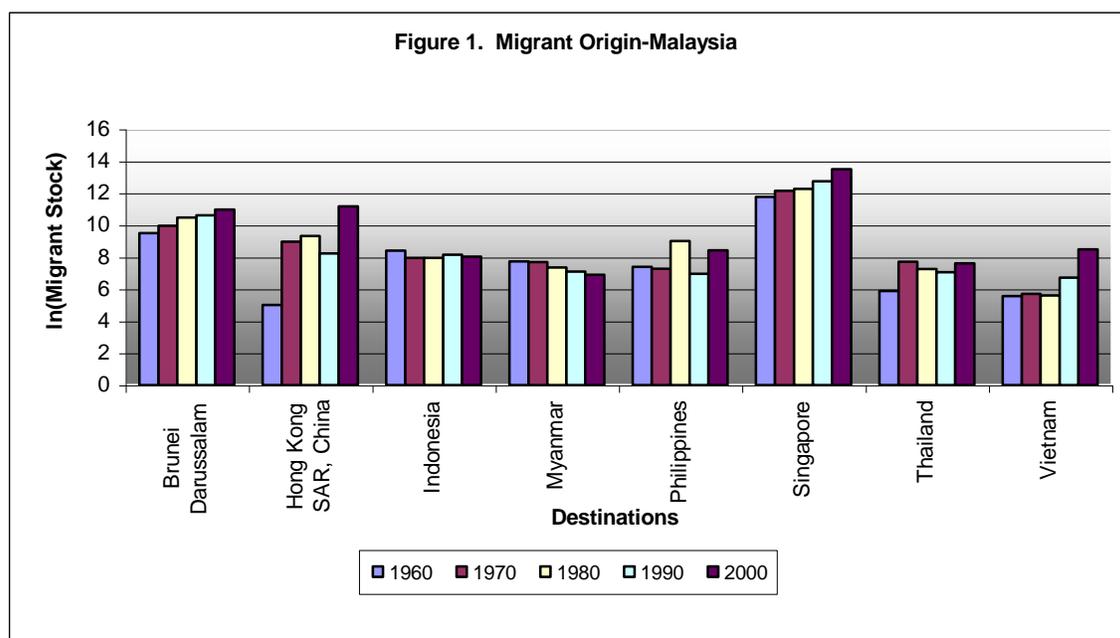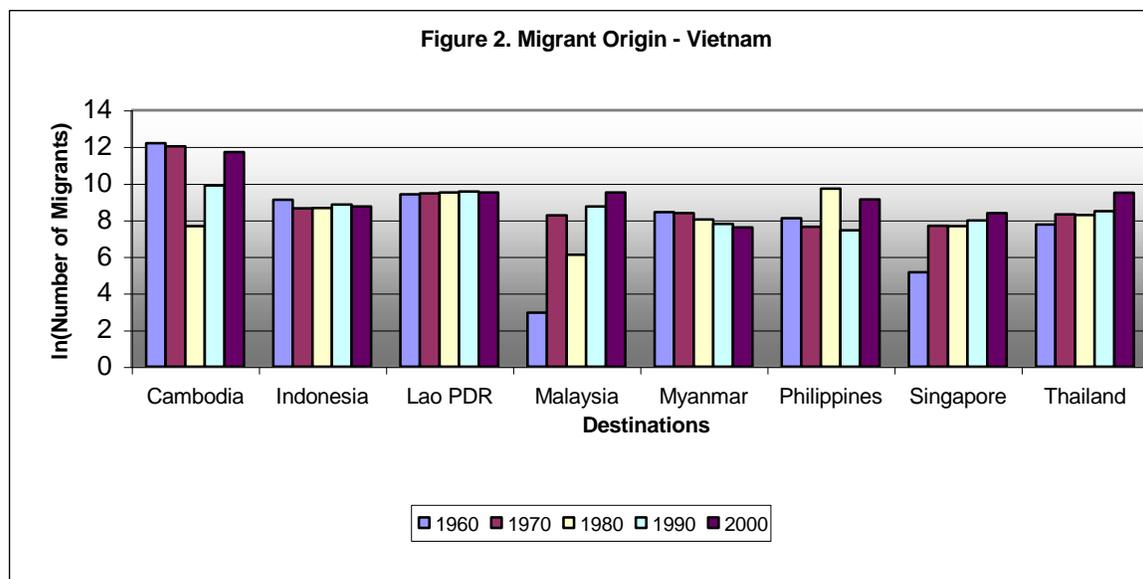
Source: ILO-ASEAN Database, ILO

Migrants from Singapore (figure 4) work in Malaysia and by larger number in Hong Kong. Skilled and unskilled workers originating in the Philippines (figure 5) work in large numbers in Singapore, increasingly in South Korea, as also in Hong Kong, although the decadal rates show significant changes in the flow. Figures 6-9 similarly show the origin-destination combinations chosen by migrants over the last five decades.
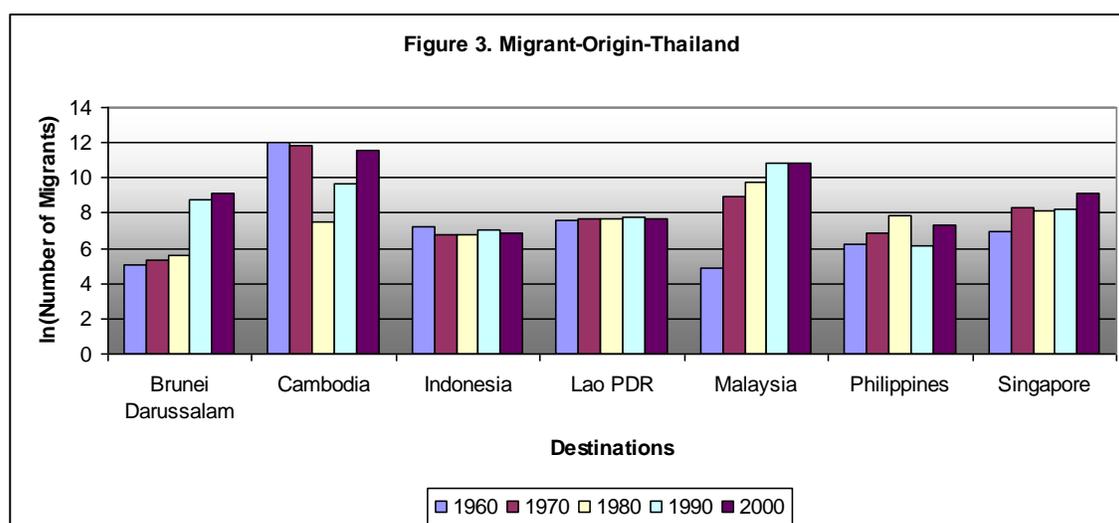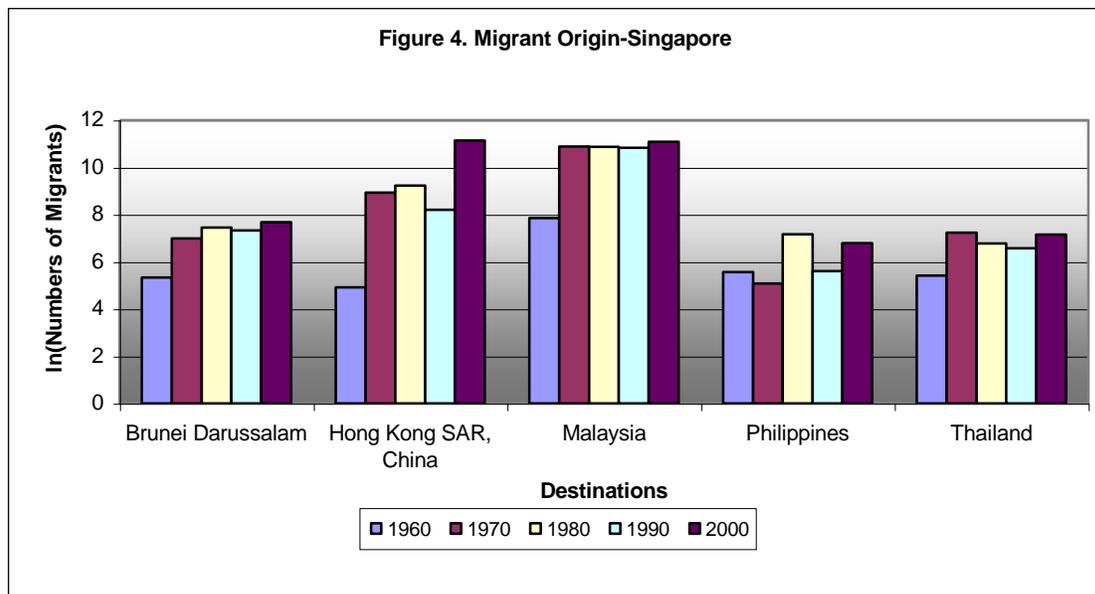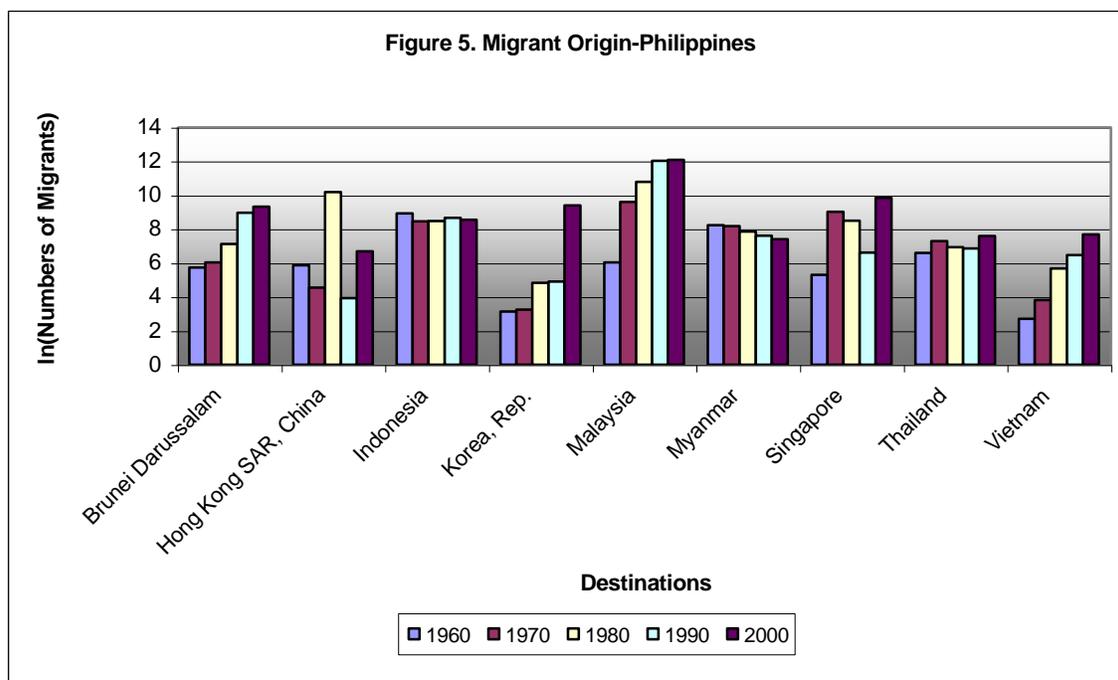
Figure 3. Migrant-Origin-Thailand

Source: ILO-ASEAN Database, ILO

Figure 4. Migrant Origin-Singapore

Source: ILO-ASEAN Database, ILO

Figure 5. Migrant Origin-Philippines

Source: ILO-ASEAN Database, ILO

Figure 6. Migrant Origin-Myanmar

Source: ILO-ASEAN Database, ILO

Figure 7. Migrant Origin-Indonesia

Source: ILO-ASEAN Database, ILO

Figure 8. Migrant Origin-Lao PDR

Source: ILO-ASEAN Database, ILO

Figure 9. Migrant Origin-Cambodia
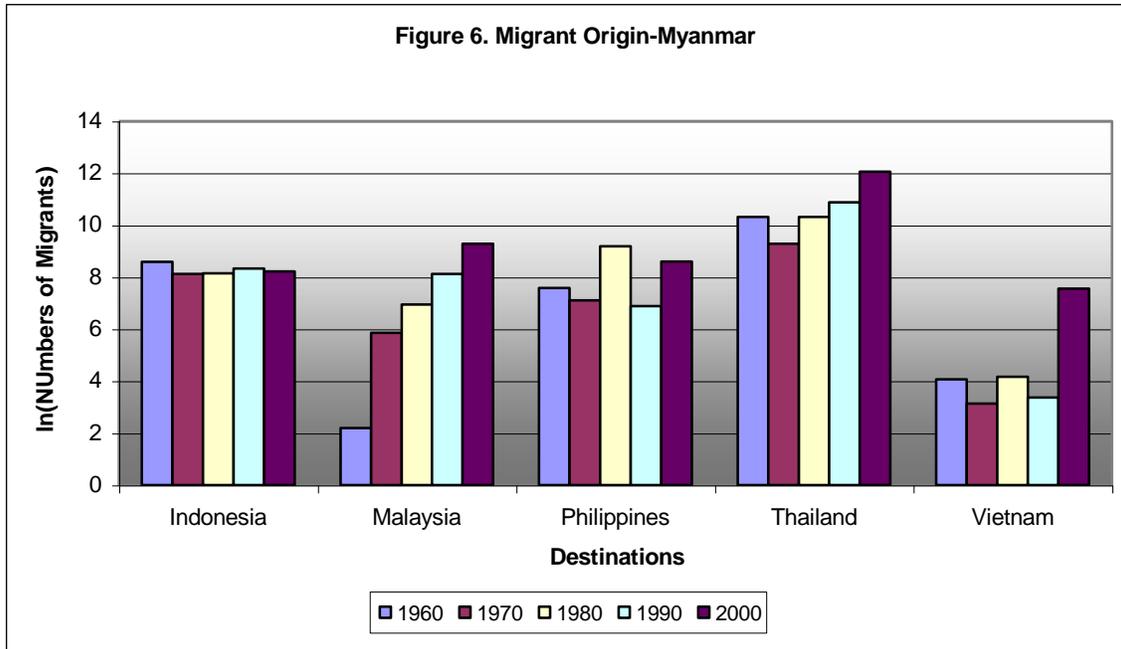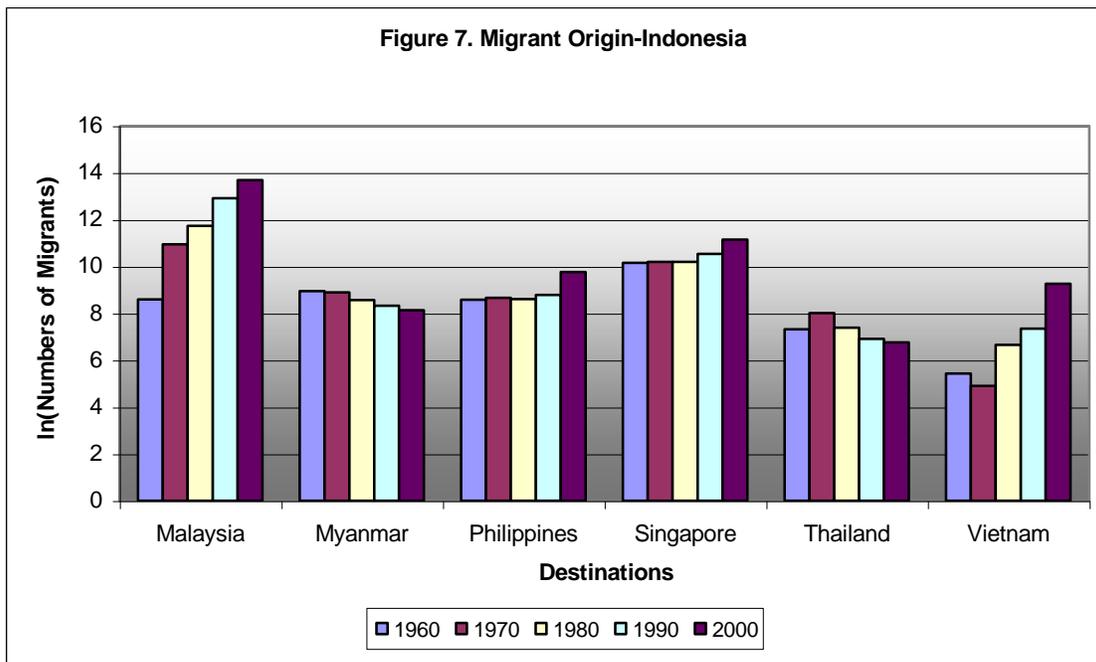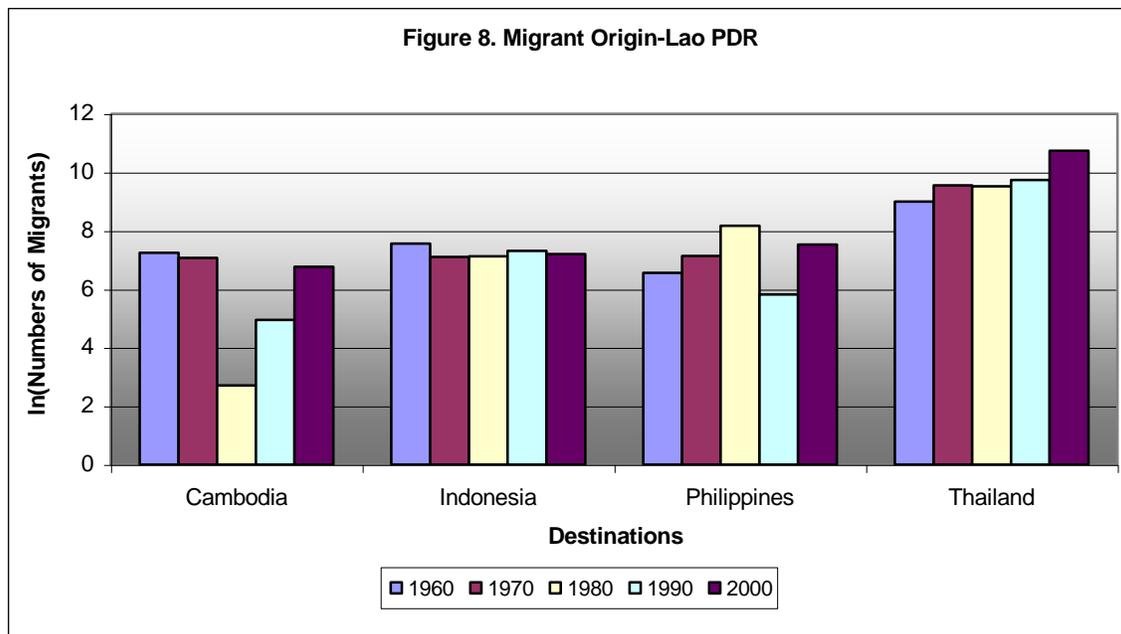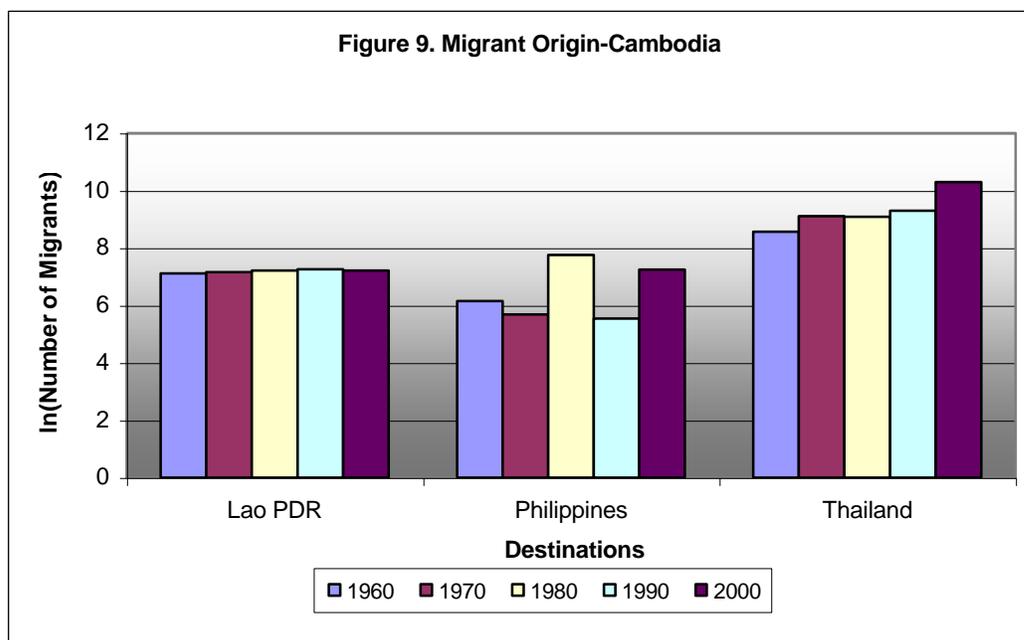
Source: ILO-ASEAN Database, ILO

Figure 10 shows that countries within ASEAN are also accepting relatively more skilled migrants in their workforce. The graph registers inflow of workers with advanced training as proportion of workers with basic and intermediate training. The ILO-ASEAN database on migration of these workers offers some indication that over the last decade the proportion has varied from 5% in Thailand to approximately 40% in Malaysia. Within the 'total' cohort, the growth of more educated female migrants for both Thailand and Malaysia is significantly visible as compared to their male counterparts. Figure 11 shows the proportion of skilled workers (advanced training/basic plus intermediate training) emigrating from Indonesia. From 2-3% in 2010, the share of skilled male workers has reached 14% in 2014, 18% for all migrants and a substantially high 29% for female workers. In the following section we investigate if expansion of trade has been instrumental in driving these results.

Figure 10. Skilled/Unskilled Inflow by Country: Malaysia, Thailand
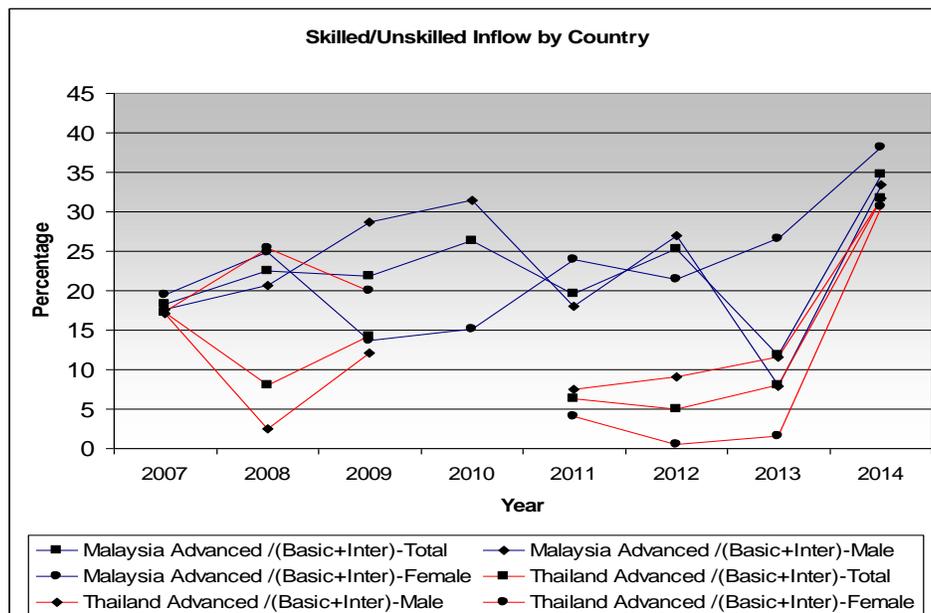
Source: ILO-ASEAN Database, ILO

Figure 11. Skilled/Unskilled Outflow by Country: Indonesia
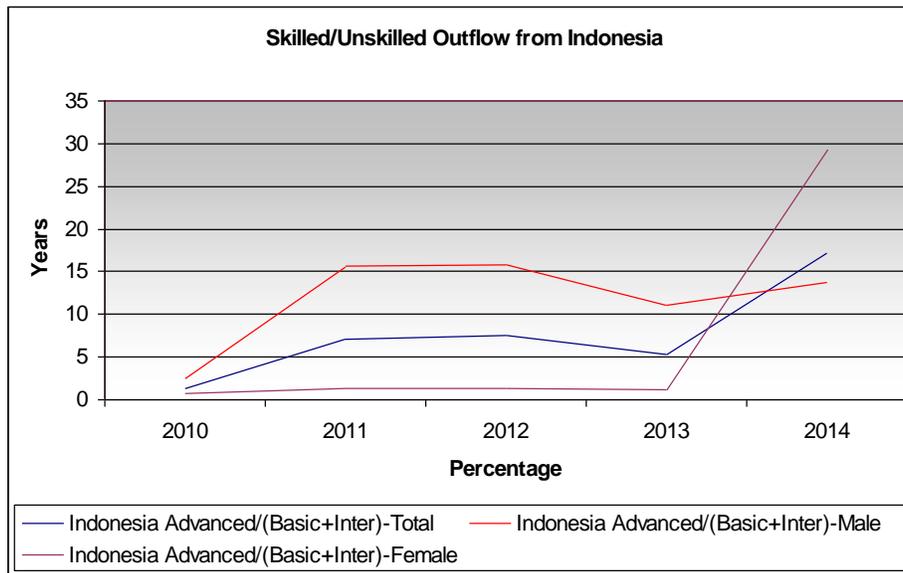
Source: ILO-ASEAN Database, ILO

3.   Empirical Results and Discussion

Data Sources and Variables

We gathered data on international trade for a set of 10 member countries in the

ASEAN, of which the smaller partners such as Brunei have fairly negligible statistics on

the variable of importance, namely *net inflow of migrants*, annually. The remaining

countries (source, International labor migration statistics database for ASEAN

ILO, Geneva) offer considerable number of entries annually on the inflow and outflow by

male and female workers in the region, albeit only sporadically for a few countries in

terms of skill distribution. The dependent variable in the following regression analysis is

the *net inflow* of workers. This is defined as *inflow of workers minus the outflow of*

workers for the ith country in the tth year. Thus, if the net inflow is negative, it suggests

more outflows from a country than inflows. Thus if more trade leads to a positive change in the net inflows it means a complementary relationship between the two at the source: as the amount of trade rises, net inflow rises. Conversely, if more trade leads to a negative impact on the net inflows, i.e. outflows rise and inflows fall or remain same, then it generates a substitutable relation. The period under consideration is 1990 to 2014. We consider labor force participation by male (*Labor Male*) and female (*Labor Female*) workers in order to accommodate and analyze the sex-wise response to change in international trade between these countries. The hypothesis is that more trade leads to greater emigration from a country.

In the process we consider a number of other explanatory variables, or the co-variates. For example, if the labor force participation of the male workers increases for the country also, and increase in trade has a negative impact on that too, it means that trade affects net inflow negatively when the labor force participation of the male falls as well. The intuition applies similarly for the female labor force participation.

The migration data is extracted at a bilateral level and then aggregated for the ith country. In addition, we collect data for a number of control variables, such as, gross domestic income (denoted as *gdp*) for the ith country, public debt (denoted as *Public debt*) for the ith country, enrollment in tertiary education (denoted as *Gross enrollment*), and most importantly, trade between the ASEAN partners (denoted as *aseanpartners*). For the trade statistics, we use aggregate trade statistics for the ith country with the other 9 partners. The data source is *UNCTAD Stats* (United Nations Conference on Trade and Development Statistics) for various years. It should be reminded that despite sufficient data on movement of goods and services between the member nations and the country

level characteristics (we use *World Development Indicators, World Bank*, various years),

the absence of continuous data on migration between partner countries limits our analysis

to only 14 years within the specified time horizon.

Empirical Methodology

We use a country fixed effects (FE) panel data estimation technique for the

period between 1990-2014. We have checked the country-specific AR(1) in the data.[4] In

addition, we also offer a pooled Ordinary Least Square (OLS) regression for the given

dataset. In both cases, the same set of variables is retained for the sake of comparability.

The full econometric model that we estimate is:

$$Net\,Inflow_{it} = \alpha + \beta_1 \sum_j (\underline{aseanpartners})_{jt} + \beta_2 (Publicdebt)_{it} + \beta_3 (gdp)_{it} +$$
$$\beta_4 (Gross\,enrollment)_{it} + \beta_5 (Labor\,male)_{it} + \beta_6 (Labor\,female)_{it} + \varepsilon_{it}$$

$$(17)$$

where, the variables are defined above, $\sum_j (\underline{aseanpartners})_{jt}$ stands for the ith country's

aggregate trade balance with the sum of the jth partner countries within ASEAN

and β_j are regression coefficients. Of these, our main interest lies with β_1 in the presence

of other control variables. If β_1 is negative, it means that greater volume of trade leads to

negative net inflow of workers from the ith country. As defined above, a negative net

inflow means greater outflows at a constant (or decreasing) level of inflows. This is

consistent with the migration hump in the short to medium run as discussed in section 1.

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[4] Autoregressive (stochastic) process is used in statistical calculations in which future values are estimated based on a weighted sum of past values. An autoregressive process operates under the premise that past values have an effect on current values. A process considered AR(1) is the first order process, meaning that the current value is based on the immediately preceding value.

Conversely, if the coefficient is positive, it implies that more trade leads to more inflow at a constant or decreasing outflow for the country, which promotes expansion of trade. The second possibility suggests that trade and migration are substitutes. More opportunities created via expansion of international trade keeps native workers at home and invite foreigners from outside. This is what we investigate empirically. Note that, due to the presence of negative values with both trade balance and net inflow of workers, standardization of coefficients with the help of natural logarithms has been ruled out. The results are reported below.

Results

Table 1 offers the impact of trade between ASEAN partner countries on the dependent variable, *Net Inflow* of workers in the presence of a number of control variables that are specific to the ith country. The top panel of Table 1 shows that the variables do explain a significant portion of the empirical relation between trade and patterns of migration. Since, the coefficient of trade as represented by *aseanpartners* is negative and significant at 1% level, it implies that more trade leads to lesser net inflows. The result validates our hypothesis that trade and aggregate emigration are complements for the ith country justifying the trade reform to migration hump relation as described above. How does this result appear in the presence of the control variables defined above? First of all, more trade in the presence of a rise in male labor force participation lowers net inflow. This may imply that creation of trade for the ith country crates opportunities for workers to emigrate in larger numbers. It may indicate the presence of push factors, where trade often lowers the returns to relatively unskilled labor and/or raises income to promote

emigration. It can be easily seen that the same conjecture is not true when female labor force participation rises and trade is promoted for a given country. The coefficient is negative but non-significant. The rise in public debt in the presence of expansion of trade has a positive impact on net inflow. Once again, it suggests that expansion of both international trade and public debt, which might result from expansion in public expenditure above the amount of revenue collected, may turn into immigrant magnets for the ASEAN countries. It is well known in the related literature that countries with generous public spending attract immigrants. Furthermore, both greater enrollment (significant at 10% and therefore a weaker result) in tertiary education and rise in GDP (significant at 1%) along with trade reforms lower net inflow of workers. A rise in GDP during a period of trade liberalization can cause to lower net inflow by funding emigration. The rise in enrolment leading to fall in net inflow also suggests that greater skill formation at the source leads to greater outflow of workers when trade expands. In fact, the result seems more compelling for countries that register more outflows than inflows and therefore a negative net inflow.

Table 1.   Panel regression with net inflow: Impact of International Trade

Fixed-effects(within)regression				Number of obs =	224	
Group variable: country				Number of groups	10	
R-sq: within =0.9708				Obs per group: min =	13	
Between=0.0793 Overall = 0.0752				Avg =	20.1	
				Max =	22	
				F(6,5) =	27.67	
Corr(u_1,Xb)=-.2867				Prob > F =	0.0001	
Net inflow	Coeff.	Std.Err	t-value	P > t	[95% Conf. Interval]	
Aseanpartners	-0001815***	.0000308	-5.89	0.002	-.0002608	-.0001023
Labor male	-73023.66***	13601.71	-5.37	0.003	-107988	-38059.34
Labor female	-7408.419	163336.95	-0.45	0.669	-49403.89	34587.05
Public debt	2447.05*	1236.364	1.98	0.105	-731.1241	5625.224
Gross enrollment	-19424.55*	9891.427	-1.96	0.107	-44851.27	6002.176
Gdp	-369.502***	64.59929	-5.72	0.002	-535.5598	-203.4443
_cons	8277727***	1509250	5.48	0.003	4398077	1.22e+07
Sigma_u	1020938.4					
Sigma_e	35390.64					
Rho	.99879979	(fraction of variance due to u_1)				
F test that all u_1=0:		F(2, 5) = 16.02			Prob >F = 0.0067	

Source: Author's calculations
Note: ***, significant at 1%; **, significant at 5% and *, significant at 10%.

The above set of results is replicated for the pooled OLS presented in Table 2. Once

again, the expansion of trade, labor force participation by male workers, GDP generate

negative relations with net inflow of workers from a given country in the region. Rise in

female labor force participation does not offer a significant relationship when trade

liberalization is pursued. Rise in Public debt and gross enrollment in tertiary education

show positive relations, meaning more inflows than outflows in case of a positive trend in

net inflow and conversely for a negative trend in net inflow of workers on the aggregate

for the ith country. These results are supported by the correlation matrix (table AII.1) and

the summary statistics both relegated to the appendix (Appendix II). It shows that the

results do not suffer from issues of multi-collinearity.

Table 2.   *Pooled regression with net inflow: Impact of International Trade*

Souce	SS	Df	Ms	Number of obs	=224	
				F(6,7)	=257.90	
Model	1.0254e+13	110	1.7089e+12	Prob > F	=0.0000	
Residual	4.6385e+10	107	6.6264e+09	R-squared	=0.9405	
				Adj R-squared	=0.89	
Total	1.0300e+13	217	7.9231e+11	Root MSE	=81403	
Dependent Variable	**Net Inflow**					
	Coef.	Std.Err	t-value	P > t	[95% Conf. Interval]	
Aseanpartners	-.000339***	.0000291	-11.66	0.000	-.0004078	-.0002703
Labor male	-11877.1***	24893.22	-4.77	0.002	-177640.2	-59913.98
Labor female	16574.11	15302.25	1.08	0.315	-19609.96	52758.17
Public debt	4690.808*	2435.491	1.93	0.095	-1068.214	10449.83
Gross enrollment	32310.98**	8476.564	3.81	0.007	12267.09	52354.87
gdp	-629.341***	94.05808	-6.69	0.000	-851.7525	-406.9285
_cons	1.01e+07	2462628	4.08	0.005	4230408	1.59e+07

Source: Author's calculations

Note: ***, significant at 1%; **, significant at 5% and *, significant at 10%.

4.   Concluding Remarks

Migration of labor across countries is largely determined by individual choices, to the extent that migrants are often considered as outcomes of self-selection in the labor market. The process of self-selection involves consideration of significant income risk (and volatility) and several other factors specific to both source and destination countries. The existing literature has substantial reference to migration patterns and trends for a large number of countries using historical data. The intra-ASEAN migration patterns in recent times has started receiving some attention, although the frequency of discussion pertaining to such migration is much less than what one observes for north-south migration in general, and intra-European or within NAFTA countries, in particular. This paper tried to address some questions within this broader context, especially attempting to relate the flow of workers within ASEAN to the evolving trade patterns in the region.

The expansion of trade within countries that are part of the ASEAN economic zone have also started growing to a considerable extent over the last decade, offering a viable alternative to the observed north-south trade relations. The creation of south-south trade in commodities that these countries engender is principally owing to substantial comparative advantage in textile, processed food, jute, leather, semi-finished manufacturing commodities and services, etc. These commodities started gaining predominance in the trade basket of several participating countries. The economic zone is not restricted to the member countries alone, but has attracted other larger markets from Asia to participate in the generic version of south-south trade and factor flows.

We showed in this paper that international trade in commodities and services may beget more emigration, and skilled emigration as well captured in terms of higher enrollment in tertiary education. The empirical results support a part of the large literature, which clearly suggest how expansion of trade is associated with more migration across countries. In some cases, depending on the initially observed trend regarding the level of net inflow or outflow of workers from a member country of the ASEAN, a substitutable relation is also feasible at the time of expansion of trade. In effect, if the countries of the ASEAN move towards complete free trade, it is possible that the expansion of trade may either have a substitutable relation or a complementary relation following the asymmetric growth patterns. We also deployed a number of control variables to show that the proposed relationship may either get dampened or facilitated by the presence of factors like rising public debt, growth in national income in the source country, or a rise in male and female labor force participation along with skill accumulation through higher enrollment in tertiary education. We plan to extend this

analysis by invoking a number of interaction terms to explore the precise transmission mechanism behind such projected changes following growth in international trade in the region. Furthermore, the same questions may also be answered by the construction of a typical gravity model, although it seems that the direction of outcomes shall not change substantially.

Finally, we offered a brief analytical model to precede the empirical results mainly because migration of skilled and unskilled workers continues to be independent rational decisions and it may be sensitive to several factors in both destination and source countries. The relationship between expansion of trade and its impact on wages of skilled and unskilled workers could be one such factor. We intend to empirically verify other sources of changes at the bilateral level to predict the migration patterns within ASEAN.

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Appendix I

Table AI.1 Correlation matrix

	Outflow of migrant	Inflow of migrant	Gdp	Gross enrolment	Public debt	laborf	laborm	Asean partners	Net inflow
Outflow of migrant	1.0000								
Inflow of migrant	-0.8515	1.0000							
Gdp	-0.3146	0.1788	1.0000						
Gross enrolment	-0.6565	0.6695	0.8150	1.0000					
Public debt	-0.3666	0.4866	-0.5185	-0.1237	1.0000				
Laborf	-0.3214	0.1908	0.9470	0.8354	-0.5423	1.0000			
Laborm	0.5902	-0.4953	0.1077	-0.1987	-0.5536	0.0307	1.0000		
Asean partners	**0.8344**	**-0.8776**	**-0.5201**	**-0.8013**	**-0.1431**	**-0.4542**	**0.2111**	**1.0000**	
Net inflow	**-0.8995**	**0.9950**	**0.2087**	**0.6826**	**0.4751**	**0.2200**	**-0.5248**	**-0.8898**	**1.0000**

SUMMARY STATISTICS

Table AI.2 Aseanpartners (trade data)

	percentiles	smallest		
1%	-1.15e+10	-1.27e+10		
5%	-7.65e+09	-1.19e+10		
10%	-6.55e+09	-1.15e+10	obs	225
25%	-2.04e+09	-1.14e+10	Sum of wgt	225
50%	-4.22e+08		Mean	0
		Largest	Std. Dev	5.28e+09
75%	1.39e+09	1.67e+10		
90%	6.40e+09	1.91e+10	Variance	2.79e+19
95%	9.63e+09	1.95e+10	Skewness	.9343842
99%	1.61e+10	2.08e+10	Kurtosis	5.485679

Table AI.3 Labour male

	Percentiles	Smallest		
1%	78.5	78.4		
5%	80.7	78.4		
10%	81.3	78.5	Obs	225
25%	82.6	78.8	Sum of wgt	225
50%	84.5		Mean	84.27111
		Largest	Std. Dev	2.341647
75%	86	88.6		
90%	87.3	88.6	Variance	5.483313
95%	87.8	89.4	Skewness	-.192807
99%	88.6	90.3	Kurtosis	2.624

Table A1.4 Labour female

	Percentiles	Smallest		
1%	44.7	44.5		
5%	46.5	44.6		
10%	46.8	44.7	Obs	225
25%	52.5	44.8	Sum of wgt.	225
50%	70.9		Mean	66.628
		Largest	Std. Dev.	13.91321
75%	79.5	84.7		
90%	81.6	84.7	Variance	193.5774
95%	82.9	84.7	Skewness	-.2469814
99%	84.7	84.7	Kurtosis	1.35871

Table A1.5. Public debt

	Percentiles	Smallest		
1%	22.45021	22.45021		
5%	24.38853	22.99345		
10%	27.70962	23.90756	Obs	80
25%	39.94394	24.38063	Sum of wgt.	80
50%	53.4916		Mean	58.41268
		Largest	Std. Dev.	24.16321
75%	73.63242	107.0225		
90%	96.18124	107.3366	Variance	583.8621
95%	106.6624	109.311	Skewness	.4988143
99%	109.744	109.744	Kurtosis	2.351954

Table A1.6. Gross enrollment

	Percentiles	Smallest		
1%	.75	.63		
5%	1.38	.75		
10%	2.16	.96	Obs	166
25%	6.77	1.13	Sum of wgt.	166
50%	16.4		Mean	18.23735
		Largest	Std. Dev.	13.45778
75%	27.92	50.03		
90%	37.13	51.23	Variance	181.1118
95%	44.16	51.4	Skewness	.5854219
99%	51.4	52.58	Kurtosis	2.512059

Table A1.7. GDP (current $)

	Percentiles	Smallest		
1%	143.5573	98.03187		
5%	260.6181	142.9659		
10%	319.6125	144.1487	Obs	200
25%	682.6257	189.2605	Sum of wgt.	200
50%	1408.355		Mean	5593.927
		Largest	Std. Dev.	10838.05
75%	3920.761	53121.23		
90%	21577.95	54577.14	Variance	1.17e+08
95%	28637.37	55979.76	Skewness	3.011681
99%	55278.45	56284.58	Kurtosis	12.0476

Table A1.8 NET inflow of migrants

	Percentiles	Smallest		
1%	-465556	-465556		
5%	-433629	-433629		
10%	-332487	-348001	Obs	32
25%	-133335.5	-332487	Sum of wgt.	32
50%	575851.5		Mean	545839.2
		Largest	Std. Dev.	819802
75%	947475	1663670		
90%	1663670	1855496	Variance	6.72e+11
95%	2161871	2161871	Skewness	.5759718
99%	2254720	2254720	Kurtosis	2.15173

Table A1.9. Inflow of migrants

	Percentiles	Smallest		
1%	236	236		
5%	508	368		
10%	28138	501	Obs	65
25%	79618	508	Sum of wgt.	65
50%	567700		Mean	610620.4
		Largest	Std. Dev.	600725.6
75%	942000	1714701		
90%	1601620	1920420	Variance	3.61e+11
95%	1714701	2230899	Skewness	.9376989
99%	2337687	2337687	Kurtosis	3.279565

Table A1.10. Outflow of migrant

	Percentiles	Smallest		
1%	4469	4469		
5%	7736	6321		
10%	9154	7736	Obs	52
25%	35377	7900	Sum of wgt.	52
50%	64727.5		Mean	136420.4
		Largest	Std. Dev.	142355.9
75%	188585.5	435219		
90%	418176	444624	Variance	2.03e+10
95%	444624	465485	Skewness	1.220095
99%	493694	493694	Kurtosis	3.296796