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How Does Bilateral Trade and Other Socio-Economic Factors Influence: The International Migration Flows in ASEAN Countries

Huynh Hien Hai*

Foreign Trade University, Ho Chi Minh Campus, No. 15 - D5 Street, Ward 25, Binh Thanh District, Ho Chi Minh City, Vietnam

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Abstract: This study utilizes the gravity model and various estimation methods such as OLS, FGLS, and GMM to analyze the effects of bilateral trade and other factors on migration flows in ASEAN countries. Specifically, the study examines the impacts of population, gross domestic product per capita, rule of law, human development index, and the contiguous border between two countries. The results indicate that bilateral trade and lagged migration flows have a positive effect on migration, while the population has a negative effect. The study finds that bilateral trade encourages more people to migrate from one country to another country and that migration flows display a high degree of persistence over time. Additionally, the study finds that contiguous borders also have a positive impact on migration. Furthermore, the study suggests that the size of the population's impact on migration flows may be increasing due to the surplus of labor in some areas and the lack of labor in others. Interestingly, the study also finds that higher levels of human development in the destination country may lead to a decrease in international migration flows, possibly due to the availability of better educational opportunities.

Keywords: International migration flows, bilateral trade, ASEAN.

1. Introduction

It is noteworthy that a significant proportion of migrants who have arrived in ASEAN countries come from within the region. For instance, out of the total of 3,635,085 migrants in Thailand, 3,494,666 are from other ASEAN countries. Similarly, there are 1,917,109 migrants who have migrated from ASEAN countries to Malaysia, compared with 3,430,380

* Corresponding author
E-mail address: huynhhienhai.cs2@ftu.edu.vn
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migrants from the world. This is the same trend in Singapore and some other countries.

According to the data of the Comtrade Database (United Nations, 2020), the total intra-ASEAN trade estimated of Singapore, Thailand, and Vietnam soared at a high value compared with the other countries in ASEAN in 2019, when the bilateral trade of Singapore increased from $74,921,624,521 (2010) to $190,479,957,111 (2019). Similarly, this figure in Thailand rose from $32,607,585,427 to $104,355,676,162 and for Vietnam was $57,030,721,866 in 2019.

Although trade and migration have been extensively studied across various disciplines, their inter-relationship remains a topic of debate (Adedoyin et al., 2020; Bang & MacDermot, 2018; Czaika & Parsons, 2017; D'Ambrosio et al., 2019; Figueiredo et al., 2016; Macková et al., 2019; Natanael & Verico, 2019). Adedoyin et al. (2020) found that migration is negatively related to trade. Figueiredo et al. (2016) revealed an unequal impact of Regional Trade Agreements (RTAs) on the various quantiles of the distribution of migration settlements. In a modern and globalized economy, comprehending the linkage between trade and migration is imperative, as they are significant components. This research comprises three interrelated studies on trade and migration, utilizing newly estimated data on international migration flows, to investigate these connections, as well as the possible roles of trade and migration in socio-economic concerns. Particularly, the objective of this research is to explore the correlation between trade and migration flows, as well as to propose measures to reinforce the migration trend with the rising trade value in ASEAN.

To investigate the relationship between migration and trade in the ASEAN region from 1990 to 2019, the paper is constructed into 6 sections. After the introduction, Section 2 discusses the current literature about migration and trade. Section 3 provides a description of the research methodology and data, while Section 4 covers the discussion of the empirical findings. Furthermore, this paper gives some discussion and clarifies some suitable reasons in Section 5. Finally, Section 6 involves a conclusion and policy implications about migration and trade for ASEAN countries.

2. Literature review

There has been significant literature on the migration – the socio-economic problems nexus from 1885 or so. Ravenstein (1885) analyzed the reasons for migration relative to the distance, law, taxes, social environment, human rights and the desire of higher livelihoods. Lee (1966) published the theory of attraction and repulsion in migration, elucidating the contrast between factors that push individuals away from their place of origin (repulsive factors) and those that pull them towards their destination (attractive factors), as well as the factors influencing migration patterns. Interestingly, it is worth noting that Tinbergen (1962), Pöyhönen (1963), and Deardorff (1984) introduced the gravity model as a prevalent method to scrutinize and forecast economic indicators, especially for analyzing bilateral trade flows.

The bifurcation in the recent literature has identified the relationship between bilateral trade and migration. The first stream researches the way in which migration impacts trade or economic aspects (Adedoyin et al., 2020; D'Ambrosio et al., 2019). The second stream focuses on the effects of trade and other factors on migration (Bang & MacDermot, 2018; Figueiredo et al., 2016; Macková et al., 2019; Natanael & Verico, 2019). This paper focuses on the second stream, in which this research found the effects of trade or other economic factors on international migration flows.

There are a number of motivations for migration among the gravity models, including the origin and destination country belonging to regional trade agreements, visa and asylum provision, distance, population, World Trade Organization membership, borders, colonial history and common language (Figueiredo et al., 2016). Bang & MacDermot (2018), and Macková et al. (2019) discovered the a positive relationship between the trade or foreign trade investment (FDI) and migration.

By using the Ordinary Least Squared (OLS) and generalized method of moments (GMM), Macková et al. (2019) suggested the lagged migration, trade and gross domestic product (GDP) which have a positive relationship with the stock of migrants. Both Bang & MacDermot (2018), and Macková et al. (2019) agreed the positive effects of the lagged migration/stock and the trade/FDI. But Bang & MacDermot (2018) showed the positive relationship with differences of the population, and Macková et al. (2019) illustrated the negative effect of the population on the migration/stock. On the contrary, Adedoyin et al. (2020) examined the adverse associations between trade and migration, and determined that there is a negative correlation between migration and trade.

Furthermore, this study conducts an impact analysis on the movement of natural persons within ASEAN, with a focus on the mobility of skilled workers to Indonesia from ASEAN-5 countries. (Natanael & Verico, 2019). The utilization of Feasible Generalized Least Square (FGLS) estimation techniques yielded positive outcomes regarding the mobility of skilled migrant workers from ASEAN-5 nations to Indonesia. There are also compilation issues at both regional and national levels due to variations in data availability. Moreover, the differences in how temporary individuals are defined at the national level pose a challenge to achieving comparability.

Although numerous studies have explored the nexus, this current study offers a distinctive viewpoint by examining the influence of socio-economic factors on the trade impact of migration in ASEAN countries. This paper focuses on the migration between ASEAN countries where they are being seen as part of a dynamic and moveable economic region. This research makes three contributions to the current literature on migration. Firstly, the research specifically concentrates on intra-migration among the ten ASEAN nations, using the most up-to-date data ranging from 1990 to 2019. Secondly, this paper employs the gravity model to investigate the relationship between intra-trade and intra-migration within the ASEAN region. Thirdly, the research employs several conometrics techniques (OLS, FGLS, and GMM) to confirm the robustness of our findings.

3. Data and methodology

3.1. Theoretical model

This paper aims to examine the connections between inter-country trade and migration flows. A strong gravity model is utilized to estimate the effect of trade on bilateral international migration across 10 ASEAN countries. The classical gravity model approach is employed to accomplish this. The equation below illustrates the fundamental gravity model for trade:

$$\text{TRADE}_{ij} = f\left(\frac{GDP_i.GDP_j}{DIST_{ij}}\right) \quad (1)$$

Where: TRADE_{ij} is the trade flow from country i to country j, GDP_i represents the economic mass of country i and GDP_j represents the economic mass of country j. DIST_{ij} is the distance between country i and country j. Sub-script "*i*" represents the origin country, while "*j*" refers to the destination country. When re-specified in natural logarithms and supplemented with regression coefficients, the regression equation transforms to:

$$\text{trade}_{ij} = \beta_0 + \beta_1 \log(\text{gdp}_i.\text{gdp}_j) + \beta_2(\text{dist}_{ij}) + \epsilon_{ij} \quad (2)$$

When applying the gravity model to clarify the trade of four, researchers include various variables to account for demographic, geographic, ethnic/linguistic, and economic conditions, as exemplified by:

$$\text{trade}_{ij} = \beta_0 + \beta_1(\text{gdp}_i.\text{gdp}_j) + \beta_2(\text{pop}_i.\text{pop}_j) + \beta_3(\text{dist}_{ij}) + \beta_4(\text{cont}_{ij}) + u_{ij} \quad (3)$$

Where: cont_{ij} are dummy variable for pairs of countries that share membership in a contiguous border, and pop_i. pop_j is the log of the product of the populations.

Tinbergen (1962) introduced the gravity model to illustrate international trade patterns, and economists have since found it to be effective in explaining a significant portion of the variation in international trade flows. As a result, the model has become popular for

evaluating the marginal influence of other theorized variables on international trade. Linnemann (1966), Anderson (1979), and Deardorff (1998) have all presented theoretical justifications for the model.

A gravity model of migration:

$imm_{ij} = \beta_0 + \beta_1(trade_{ij}) + \beta_2(pop_i.pop_j) + \beta_3(dist_{ij}) + \beta_4(rely_{ij}) + u_{ij}$ (4)

Where: imm_{ij} represents the log of migration to destination country i from origin country j, $trade_{ij}$ is the trade flow from country i to country j, and $rely_{ij}$ is the ratio of per capita GDP of the destination to the origin country.

The augmented migration gravity equation is suggested by these considerations:

$imm_{ij} = \beta_0 + \beta_1(trade_{ij}) + \beta_2(pop_i.pop_j) + \beta_3(dist_{ij}) + \beta_4(rely_{ij}) + \beta_5(cont_{ij}) + u_{ij}$ (5)

$imm_{ij} = \beta_0 + \beta_1(trade_{ij}) + \beta_2(gdp_i.gdp_j) + \beta_3(pop_i.pop_j) + \beta_4(dist_{ij}) + \beta_5(rely_{ij}) + \beta_6(cont_{ij}) + \beta_7(rlaw_{ij}) + u_{ij}$ (6)

Where: $rlaw_{ij}$ is the logs of the ratios of indexes indicating the degree to which the destination and origin countries adhere to the rule of law. The presence of positive coefficients implies that the higher the expected improvement in the institutional environment, the more probable it is for people to immigrate.

3.2. Empirical method

Previous empirical works of the gravity model usually employed Ordinary Least Squared (OLS), Fixed effect regression (FE), or Random effect regression (RE) (Figueiredo, Lima, & Orefice, 2016). However, in panel data analysis, OLS has several limitations of heteroskedasticity and serial or cross-sectional correlations. FE and RE regressions require other restrict assumptions. On the one hand, RE regression assumes that there are no omitted variables or the omitted variable has no correlation with the error term. On the other hand, if the omitted variable correlates with both present variables and residual, the FE estimation is more efficient than the RE and OLS. The Hausman test proposes a statistic test for us to make decision between FE or RE regression. However, the test is only to decide whether FE or RE is more appropriate than the other one. What if both FE and RE are not appropriate due to heteroskedasticity or serial or cross-sectional correlations? In this case, Feasible Generalized Least Squares (FGLS) has advantages in estimating panel data with the presence of both heteroskedasticity and serial and cross-sectional correlations (Bai et al., 2011; Brewer et al., 2013; Garba et al., 2013; Hansen, 2007).

In another aspect, considering macroeconomic elements, economic performance represented by GDP and other macro indicators, such as population and human capital usually suffers from the problem of endogeneity in empirical research (Bang & MacDermott, 2018; Figueiredo, Lima, & Orefice, 2016; and Macková, Harmáček, & Opršal, 2019). For instance, economic performance encourages children to go to school and citizens to be well educated (Carrington & Detragiache, 1998; Docquier & Marfouk, 2002; Macready & Tucker, 2011; Beine et al., 2014), and vice versa, a well-educated population or skilled labor fosters economic growth (Czaika & Parsons, 2017). Thus, the bidirectional causality in panel analysis can lead to bias estimation due to the potential correlation with an error term. This problem of endogeneity cannot be solved by FGLS regression. Therefore, to overcome the potential problem of endogeneity in our models, we propose the Generalize Moments Method (GMM) (Nguyen et al., 2019). Furthermore, the GMM model yields a more consistent and efficient estimate particularly in models characterized with serial correlation and heteroskedasticity (Adedoyin et al., 2017).

Empirically, this research proposes the following model base on the theoretical gravity model in equation (6):

$$imm_t^{ij} = \alpha_0 + \alpha_1 imm_{t-1}^{ij} + \alpha_2 trade_t^{ij} + \alpha_3 gdp_t^{ij} + \alpha_4 rely_t^{ij} + \alpha_5 pop_t^{ij} + \alpha_6 hdi_t^{j} + \alpha_7 rlar_t^{ij} + \alpha_8 cont^{ij}$$ (7)

Where: $cont^{ij}$ is the dummy variable representing for a joint land border between the destination and origin countries.

The research proposes to employ a joint land border dummy, which is also called contiguous borders, instead of distance between the two countries. This is because the concept of

"distance between two countries" is ambiguous in the case of regional analysis. The distance between the origin country and destination country is measured by the distance between the two countries' capitals. For example, the distance between Vietnam and Cambodia is reported around 1,057 km, and the distance from Vietnam to Laos is 481 km[1]. This means the capital of Cambodia is farther than the capital of Laos, if the research considers Vietnam is the origin country. However, the migration also does not mean that people must or mostly move from one country capital to the other country capital. In this case, both Cambodia and Laos share joint land borders with Vietnam, and in case of ASEAN, many members share joint land borders and migrant people can move to other neighbor countries through many ports of entry. Thus, the distance between two countries can yield a misleading result in the current research of migration within the ASEAN region. Therefore, this research proposes to use the dummy of joint land border instead of distance between the origin and destination countries.

From equation (7), this paper aims to examine whether each of the components of gdp_t^{ij} and pop_t^{ij} between origin and destination countries reveal different effects of migration between the two countries. Thus, the paper alternatively employs gdp_t^{ij}, gdp_t^{i}, gdp_t^{j}, pop_t^{ij}, pop_t^{ij}, pop_t^{i}, and pop_t^{j} in our empirical analysis.

One potential problem of multi-collinearity can occur in the simultaneous use of both gdp_t^{ij} and $rely_t^{ij}$ in one regression model, because gdp_t^{ij} and $rely_t^{ij}$ are all calculated by GDP per capita. Therefore, this paper suggests developing two distinct regressions for each of gdp_t^{ij} and $rely_t^{ij}$.

3.3. Data source and variable description

The gravity model used in this study describes the relationship between international migration flows and bilateral trade and other relevant factors such as GDP, population, and many others. The research uses data of 10 ASEAN countries (including Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam) over seven five-year periods from 1990 to 2019. Total migrant stock moving from the origin to the destination country in periods 1990-2019 is reported every five years by the United Nations (UN). Bilateral trade flows were obtained from the UN Comtrade Database, which belongs to the UN database. The population (in thousand people) of the 11 countries is also derived from the UN database. The dummy of contiguous border or joint land border ($cont_{ij}$) is assigned by the authors, in which the value is recorded as one if the two countries share a joint land border, otherwise, the value is zero. GDP per capita is from the World Development Indicators. There are two components that can be extracted from the GDP per capita. The first one is the "capacity of the two economies", which is the multiplication between the GDP per capita of the two countries. The second one is the ratio of GDP per capita of the destination country to the origin country. The ratio represents the difference of economic capacity between the two countries. Other control variables are: (i) Human Development Index (HDI) obtained from UN (Human Development Reports) representing the human capital of the destination country (reference); (ii) The difference of rule of law between the destination country and the origin country. The model calculates the difference throughout the ratio of rule of law of the destination country to the origin country. The Rule of law is obtained from the Worldwide Governance Indicators database by the World Bank. This study is constrained by data availability, and thus, only covers the period from 1990 to 2019. Moreover, the research results can acknowledge that updating data during the Covid-19 pandemic could substantially impact the research findings as trade and mobility between countries has been severely restricted. While the author recognizes this as a limitation, it also presents an intriguing avenue for future research in this field of study.

[1] Data is extracted from the DistanceFromTo website (retried from https://www.distancefromto.net/).

Table 1: List of variables and data sources

Variables	Abbreviation	Description	Source	Reference
International migration flows	imm_{ij}	Total migrant stock at mid-year by origin and destination in periods 1990-2019. International migrants from country i to country j.	United Nations Population Division	Figueiredo et al. (2016), Bang et al. (2018), Macková et al. (2019), Natanael et al. (2019)
Total bilateral exports between two countries	$trade_{ij}$	Bilateral trade flows which are calculated by total bilateral exports between two countries.	UN Comtrade Database	Macková et al. (2019)
Population	pop_{ij}	The total population country j and country j (in thousand people)	United Nations Population Division	Figueiredo et al. (2016), Bang et al. (2018), Macková et al. (2019), Natanael et al. (2019)
The ratio of destination to source country per capital income	$rely_{ij}$	The ratio of destination to source country per capital income (PPP, USD, constant 2017).	World Development Indicators	Figueiredo et al. (2016), Bang et al. (2018), Macková et al. (2019), Natanael et al. (2019)
Human Development Index	hdi_j	Human Development Index (HDI) at the destination country (country j).	Human Development Reports	Lewer et al. (2008)
Rule of law index (−2.5 weak; 2.5 strong)	$rlaw_{ij}$	The ratio of destination to source country the rule of law.	The Worldwide Governance Indicators (WGI, Worldbank)	Adedoyin et al. (2020), Bang & MacDermot (2018), Macková et al. (2019)
The contiguous border between two countries (1: Yes; 0: No)	Cont	Dummy variable which shows the contiguous border between two countries.	The authors calculate this data	Figueiredo et al. (2016)

Source: Author.

4. Results

The research begins with the analysis from the OLS regression of the model (Table 2). Both the variables at the country level (GDP and population) are significant and with the expected sign, supporting the choice of a gravity model. In Table 2, total bilateral trade impact positively on international migration flows in all of the models. From this estimation, an increase in total bilateral trade positively influences the international migration flows. It shows that a 1% increase in the two-country trade increases migrants by about 0.128% (in model 1). The previous migration flows significantly and positively affect international migration flows. As previous migration flows increase by 1 percent, so migration flows increase by 0.86 or 0.89 percent. On other hand, the multiplication of the populations between original and destination countries significantly and negatively affects bilateral international migration, which decreases 0.08 percent when the population increases 1% (in model 1 and model 4). Interestingly, the population of a destination country negatively affects migration flows when a 1% increase of destination decreases migration flows about 0.137% (in

model 5). There are not clearly significant impacts of the GDP per capita of origin or destination on international migration flows throughout the OLS

Table 2: Panel OLS regression with robustness standard error

Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
limmij = L,	0.861***	0.870***	0.866***	0.866***	0.853***	0.896***
Ltradeij	0.128**	0.116**	0.119***	0.125**	0.126**	0.118***
Hdi	0.152	-0.498	-0.466	0.228	0.552	
Cont	0.257	0.285	0.308	0.251	0.321	
Rlawij	-0.004	-0.005	-0.005	-0.004	-0.004	
Lpopij	-0.008*	-0.005		-0.008*		
Lgdpij	-0.009					
Relyij		0.010*	0.006			
Lpopi			-0.023		-0.020	-0.045
Lpopj			-0.086**		-0.137***	-0.135***
Lgdppci				-0.058	-0.023	-0.042
Lgdppcj				-0.094	-0.160**	-0.127**
Constant	0.015	-0.440	0.087	0.634	1.504	1.909
Observations	285	285	285	285	285	307
Number of code	66	66	66	66	66	66

Robust standard errors in parentheses.
Note: ***p < 0.01, **p < 0.05, *p < 0.1.

Source: Author.

Table 3: Cross-sectional time-series FGLS regression

Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
limmij = L,	0.979***	0.973***	0.978***	0.981***	0.972***	0.973***
Ltradeij	0.055***	0.058***	0.058***	0.053***	0.058***	0.057***
Hdi	-0.330	-0.640***	-0.775***	-0.225	-0.151	
Cont	0.023	0.010	0.055	0.011	0.051	
Rlawij	-0.000	0.000	-0.004***	-0.001	-0.000	
Lpopij	-0.004***	-0.004***		-0.004***		
Lgdpij	-0.003***					
Relyij		0.003*	0.004			
Lpopi			-0.034***		-0.020	-0.020
Lpopj			-0.048***		-0.074***	-0.087***
Lgdppci				-0.018	-0.013	-0.017
Lgdppcj				-0.045***	-0.093***	-0.103***
Constant	0.051	-0.096	0.427***	0.289**	1.129***	1.298***
Observations	285	285	285	285	285	307
Number of code	66	66	66	66	66	66

Standard errors in parentheses.
Note: ***p < 0.01, **p < 0.05, *p < 0.1.

Source: Author.

Table 3 represents the results using cross-sectional time-series FGLS regression. Concerning our control variables, we find that migration flows in our sample tend to be highly persistent over time, as we might expect. The size of the population's impact on migration

flows may be growing due to the fact that migrants could move from the surplus of labor to the lack of labor. On the contrary, the bilateral trade and contiguous border (which is used to estimate migration cost) impact migration positively, so that two countries having higher trade and a contiguous border will increase the migration flows.

Compared with the OLS regression, the FGLS estimation also gets similar results, which illustrates that bilateral trade and lagged migration flows positively affect international migration flows in ASEAN countries. However, we discover a significant negative impact of the human development index at the destination country on migration flows.

Table 4: GMM results

Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
L.limmij	0.357***	0.458**	0.329	0.398***	0.377***	0.487***
Ltradeij	0.875***	0.888***	0.835***	0.879***	0.848***	0.999***
Hdi	-4.356	-7.317	-3.877	-3.270	-1.257	
Cont	0.893	0.679	0.552	0.845	0.630	
Rlawij	-0.009	-0.013	-0.005	-0.007	-0.001	
Lpopij	-0.082***	-0.085**		-0.072***		
Lgdpij	-0.017					
Relyij		-0.023	-0.028			
Lpopi			-1.927		-1.003**	-1.610**
Lpopj			-1.154*		-0.673*	-0.877**
Lgdppci				-0.213	-0.312	-0.699*
Lgdppcj				-0.347	-0.459	-0.235
Constant	0.026	-0.007	22.707	1.497	12.627**	17.716***
Arellano-Bond test for AR(1)	-1.58	-1.73*	-1.37***	-1.72***	-1.66**	-1.84
Arellano-Bond test for AR(2)	-0.05	-0.10	-0.01	-0.02	0.07	0.15
Sargan test	49.64***	32.17***	23.77***	36.50***	14.31***	4.37
Hansen test	4.30	6.10	2.93	5.73	3.51	2.88
Observations	285	285	285	285	285	285
Number of code	66	66	66	66	66	66

Standard errors in parentheses, tested p_value in the squared bracket.
Note: ***p < 0.01, **p < 0.05, *p < 0.1.

Source: Author.

GMM estimation surmounts the limitation of OLS and FGLS. Table 4 presents the GMM estimated results. Interestingly, the results are the lagged migration flows, the bilateral trade, and the contiguous border impact on migration flows. The size of the population's impact on migration flows may be growing due to the fact that migrants could move from the surplus of labor to the lack of labor. Furthermore, the bilateral trade also actuates the higher migration. Interestingly, the higher human development index at the destination country leads to a decrease in the international migration flows. This could be explained by higher education possibly preventing the decision of migration from other countries.

Findings also discover the population effects negatively on migration flows when a total two-country population increase of 1% leads to the fall of migration by 0.08% s. This result is the same as the finding of Bang & MacDermot (2018) when researching the gravity model in OECD. However, this result differs from Czaika & Parsons, 2017 when their findings illustrated the destination of the population affects migration positively). It is similar to other works on estimating international migration flows when the author finds the positive effects of bilateral trade to migration (Macková et al.,

2019) when a 1% increase of trade will cause a 1% rise of international migration flows.

5. Discussion

In the current study, the research tries to examine the impacts of bilateral trade and other economic-socio factors on the international migration flows in ASEAN countries by OLS, FGLS and GMM estimations. The regression suggests that the lagged migration flows and trade variables have a positive and significant impact on the dependent variable. The research results support the findings from Macková et al. (2019).

At first, bilateral trade actuates more people who can move from one country to another country. People can find better opportunities for work when two countries promote bilateral trade. This result almost advocates the viewpoints which are provided. Gentile (2019) illustrated that ASEAN countries viewed labor mobility primarily as an expansion of open trade and investment, with a particular focus on promoting services' trade that involves the temporary admission of skilled individuals, including intra-corporate transferees, investors, and highly skilled laborers.

Second, as expected, the paper has found that migration flows in our sample display a high degree of persistence over time. The migration seems to increase over time when there is a tendency for growth. According to the 12th ASEAN Forum on Migrant Labour (ILO, 2020), The number of migrants relocating within ASEAN nations has increased tremendously, surging by more than five times since 1990. This has had an evident and substantial impact on the economic development of both the destination and origin countries. Over the past 30 years, the number of females migrating within ASEAN countries has also grown dramatically, from 0.6 million in 1990 to 3.3 million in 2017, with women now accounting for almost half of intra-ASEAN migrants (48.7 percent).

Third, our results differ with Czaika and Parsons (2017) when their findings showed the destination of population positively affects migration. Nonetheless, our findings indicate that the size of the destination population and the combined population of the two countries have a significant negative impact on international migration flows. Testaverde et al. (2017) noted that the ASEAN region is one of the few regions mentioned in the world that had an increase in migration rates from 1995 to 2015. So that countries such as Malaysia, Singapore, and Thailand have become centers of migration. These three countries currently have 6.5 million migrants from the ASEAN region, accounting for 96% of the total number of migrants. Cambodia, Indonesia, Lao PDR, Malaysia and Myanmar are the countries with the most migrants in the region. This opinion reinforces that highly developed countries attract the immigrants but our results don't find a significant effect of migration destination on human development. If the destination population increases, it decreases the migration flows.

6. Conclusions and policy implications

The research results agree with the ideas that promote the policies helping migration between countries because it is certainly the result of freedom of trade in the countries of ASEAN. This paper examines the association between bilateral trade flows, migration flows, and certain socio-economic factors that influence migration flows. Previous studies have produced inconsistent findings, and few have employed datasets from ASEAN countries that include both trade and migration flows. Therefore, our study adds to this body of literature by utilizing a more comprehensive set of data than prior research and testing our models using various estimations.

Firstly, our analysis indicates that trade and migration exhibit positive coefficients across all specifications, revealing them to be complementary. Using our preferred FGLS specification, we discovered that a one percent increase in bilateral trade between two nations is associated with a 0.057 percent rise in migration flows from the origin country to the destination

country. Additionally, based on our GMM regression, the results observed that migration flows in our sample display a persistent upward trend over time. The implications of these findings are noteworthy, particularly in light of present-day circumstances. For example, ASEAN is presently experiencing a period of robust trade activity. Many countries try to push their net exports but they forget the related policies, migration's trend especially. Future research can enhance the policy implications of these findings by expanding upon our analysis and delving deeper into the causal connections between international trade and migration.

Second, inadequacies in migration systems elevate the costs of international labor mobility, but appropriate policy reforms can mitigate these effects. Destination countries ought to strive for systems that are adaptable to economic demands while also aligning with domestic policies. Sending countries should balance the imperative of safeguarding migrant workers with the needs of economic development.

Third, despite empirical evidence indicating a pro-trade immigrant effect, concerns about the econometric methods employed exist, with the main issue being the direction of causality between trade and migration. However, this has been specifically addressed in recent studies, typically utilizing an instrumental variables approach, which establishes a causal impact of migration on trade. On the contrary, there is some evidence revealing some results, which show the impacts of trade on migration.

Finally, the issues of migration are complex because they are related to the choices of people for many reasons and they could impact both origin and destination place. The author hopes there is much well rooted research to discover this phenomenon.

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