

The role of human capital in the relationship between foreign direct investment and exports in the Association of Southeast Asian Nations

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Abstract

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Foreign direct investment (FDI) plays a vital role in capital formation and is also an indispensable factor in economic growth in developing countries. While human capital is an important resource for the production process, this capital includes skills, knowledge, and experience in the working and learning process of employees. The research objective is to investigate the role of human capital in the relationship between FDI and exports (EXP) in the Association of Southeast Asian Nations (ASEAN). The present study used the Pooled Ordinary Least Squares model, the fixed effects model and the random effects model to analyse balanced panel data from nine ASEAN countries in the period from 1990 to 2020. The research results show that FDI has a positive and significant impact on EXP in ASEAN countries. At the same time, human capital plays a moderating role in the relationship between FDI and exports in ASEAN countries. From the findings of this study, several recommendations to boost the absorption capacity of FDI in order to increase exports in ASEAN countries are proposed.

Key words

exports, foreign direct investment, human capital, moderator, trade.

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Introduction

International commerce takes place to fulfil the needs of a nation, in which exports, in particular, are a way of generating the foreign

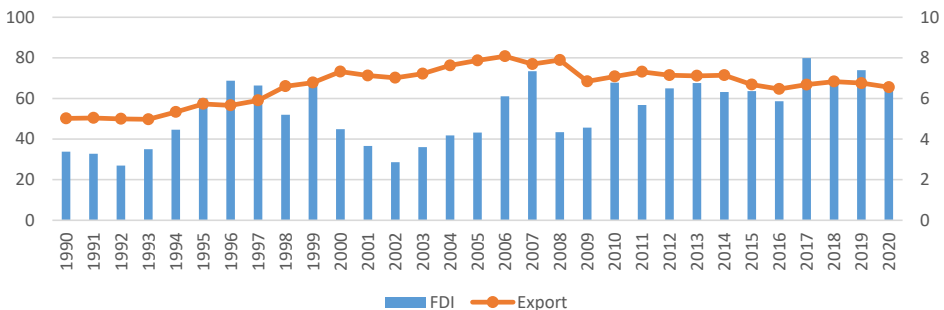
revenues necessary to fund the acquisition of products and services; achieving economies of scale, scope, and specialisation in

production; and gaining expertise on a global scale (Prasanna, 2010). In a globalised world, each country has its own particular advantages in exported products; the country is then recognised as being competitive in the trade of specific product(s). Exports, therefore, play an essential role in bringing in foreign currency to serve the fiscal and monetary needs of a country. However, the comparative advantages of most developing countries still depend on primary goods and labour-intensive manufacturing industries. Countries chronologically develop and accumulate capital and skills, wages increase, and their competitive base also adapts to the new conditions.

Consequently, economies had to upgrade their labour-intensive exports into ones with higher added value, and they had to move on to new, more advanced operations. Such an upgrade requires higher skills and technological inputs. Countries can achieve these goals in several ways. One approach is to improve the capacity of local investments, while another is to attract FDI for export-oriented activities. For developing countries, where technology and capital are lacking, relying on external resources to promote production processes and capital accumulation is faster

than improving domestic manufacturing capacities. As a result, FDI plays a vital role in the host countries' capital accumulation and technological resources, where abundant and economical labour resources are available. Moving production to another nation is a strategic decision for parent firms, for example, to escape high environmental or labour taxes in their own countries while expanding manufacturing in host countries. From the perspective of the host countries, FDI has gained greater recognition as a critical tool for resource movement across national boundaries to boost economic performance, competitiveness, and exports. Therefore, FDI flows seem to benefit both investors and host countries, which helps to rebalance and optimise capital flows because of imperfectly competitive economies. From these analyses, developing countries can receive FDI inflows when the resources, i.e. labour, manufacturing capacities, and materials, are available to absorb FDI. In turn, FDI bolsters exports by enhancing the specific export capabilities. In this context, the Association of Southeast Asian Nations (ASEAN) has indeed become a region which reliably absorbs FDI from multinational enterprises around the world.

Figure 1. Evolution of FDI and Exports in ASEAN, 1990-2020



Source: World Development Indicators (2022a, 2022b)

Figure 1 shows that FDI inflows to the ASEAN region have a typical N-shaped pattern, beginning to increase in the 1990s, then decreasing along with the Asian

economic crisis and the global financial crisis in 1997-2002 and 2007-2009, respectively, and finally growing rapidly in the period after 2009. As a result, FDI

in the region reached a record high of US\$182 billion in 2019, making ASEAN the biggest beneficiary of FDI in the developing world. Due to the unprecedented consequences of the COVID-19 pandemic, FDI in the region decreased to US\$137 billion in 2020, a considerable reduction. However, compared to the worldwide FDI decline, ASEAN did significantly better, with its share of global FDI increasing from 11.9% to 13.7% in 2020 (ASEAN & United Nations, 2021). On the other hand, the average export values for the period 1990-2020 also have the same change trend as FDI (as shown in Figure 1). In particular, the export trend line also decreased in the two phases of the Asian financial crisis and the global financial crisis, before increasing in the remaining periods. This suggests that there is a link between FDI and exports. Specifically, FDI has an impact on the exports of countries, in which the spillovers of FDI impacts emerge because foreign capital inflows may bring about a variety of competitive advantages, such as greater knowledge and technology, resulting in increased productivity, or improve the export markets in comparison to domestic enterprises (Frankel and Romer, 1999; Helpman and Hoffmaister, 1997).

This increased trend reflects increasing investor interest and confidence in investing and conducting business in the ASEAN region. Indeed, ASEAN has become one of the focal points for attracting FDI because it simultaneously satisfies various conditions to engage investors. Specifically, ASEAN is a large market, with a population of approximately 600 million people, and the economies within continue to grow, meaning that purchasing power is increasing. In addition, the ASEAN region has abundant labour resources and reasonable labour costs that can meet the outsourcing and assembly needs of large corporations. Most importantly, the region has

an export-oriented policy, which enhances the potential impact of FDI on exports. The purpose of this article is to determine if FDI has been a critical factor in the growth of exports from ASEAN countries. To do so, the researchers examine and seek to account for the influence of FDI on host economy exports. Previous studies have revealed that FDI has historically played a significant role in exporting natural resources (Asiedu & Lien, 2011; Hayat, 2018; Kinda, 2013), and its involvement in the export of certain processed agricultural goods is expanding (Amighini & Sanfilippo, 2014; Vural & Zortuk, 2011). It is also becoming more prevalent in the service sector, particularly tourism (UNCTAD, 1994). As a result, FDI inflows directly influence exports; thus, obtaining further FDI would be justifiable.

In the next section, the literature review is presented; while Section 3 describes the model and data measurement. The experimental results and discussion are presented in Section 4. Finally, the policy implications and conclusions based on the empirical results are discussed in Section 5.

1. Literature review

1.1. FDI and exports

FDI inflows bring valuable investment to host countries, including increased production capacities and export values. In detail, FDI inflows can enhance productivity through spillovers of technology and advances such as the importation of modern equipment, as well as learning by watching (Barro and Sala-i-Martin, 1997; De Mello Jr, 1997) and promoting domestic production through participation in the supply chain of joint-venture multinational enterprises (De Mello Jr, 1997). In addition, FDI enterprises directly increase host countries' export capability (Borensztein et al., 1998). Several empirical studies have supported this relationship; however, the inverted

pattern has been quite different. Aitken et al. (1997) demonstrated the external effect of FDI on exports in Bangladesh, where the entry of a single Korean multinational to the garment exports industry led to the establishment of several domestic export firms, resulting in the creation of the country's largest export industry. The authors argued that entering overseas markets lowers entry costs for other potential exporters, either through learning effects or business relationships. The spillover effects of one firm's export activities help other enterprises minimise the cost of exporting. However, Aitken and Harrison (1999) were concerned about the negative effect of FDI, arguing that multinational corporations generate fierce rivalry with indigenous enterprises due to their low marginal production costs. The advantage allows FDI corporates to capture a substantial portion of local demand, forcing domestic enterprises to reduce output, thereby increasing their average costs and diminishing their competitiveness. As a result, FDI inflows may have no effect on the economy, despite the increase in exports (Nguyen et al., 2022).

Kutan and Vukšić (2007) explained the success of host countries through the prism of the activities of multinational companies, which possess superior expertise and technology, have a better understanding of export markets, or have a stronger connection to the parent company's supply chain than do local enterprises. However, the authors also note that the evidence supports their hypotheses only for some countries which have recently joined the European Union. Prasanna (2010) stated that FDI inflows have a considerable beneficial effect on export performance when examining the FDI-exports nexus in India. Additionally, the study argued that domestic initiatives to boost manufacturing exports should be reassessed in light of the FDI regulatory scheme to obtain superlative and long-term advantages. Harding and Javorcik (2012)

found that FDI has a positive effect on export quality in developing countries, based on an examination of 105 countries from 1984 to 2000. Specifically, sectors hierarchised in national efforts to attract FDI have 11% greater unit values of exported products than other sectors. As a result, the policies, which aim to attract FDI to upgrade the export structures of developing countries, were deemed necessary. More importantly, there is no evidence that FDI enhances the similarities between the export structures of developing and developed nations, respectively. In other words, attracting FDI can be a realistic approach for low- and middle-income countries seeking to improve the quality of export values. Anwar and Sun (2018) also found that increased FDI in China's manufacturing sector resulted in a considerable improvement in the quality of Chinese exports.

On the other hand, Rehman and Ding (2020) observed that FDI outflows (OFDI) significantly boost export sophistication in China. As a result, the nexus between them could enhance the quality of exports and enable them to catch up to developed economies. Zhang and Chen (2020) added empirical evidence that OFDI has a positive and substantial effect on export sophistication in established coastal districts, but no effect is observed in less developed inland locations. Regarding the ASEAN region, Anwar and Nguyen (2011) emphasised transactional connections which formed between foreign firms and domestic ones, followed by FDI inflows in the case of Vietnam. It is revealed that the presence of foreign firms in Vietnam, via horizontal and forward connections, has a significant impact on local firms' decisions to export and their subsequent share of total exports. This means that the export spillovers experienced by Vietnamese manufacturing firms are primarily the result of horizontal and forward connections facilitated by FDI. Based on these analyses, FDI may boost a country's

export quality by enhancing domestic production capability in the region. Therefore, the hypothesis is formed to show the relationship between FDI and exports.

H1: FDI enhances the value of exports in ASEAN countries.

1.2. FDI and human capital

Human capital (HCA) may be defined as the components of health, education, and skill which are incorporated in each individual (Sehrawat & Singh, 2019), public education and research expenditure (Kohpaiboon, 2003), or the multi-dimensional index (Alvarado et al., 2021). Although the measurements vary, the association between FDI and HCA is widely observed. Borensztein et al. (1998) argue that the extent of the influence of FDI on growth in general, and exports in particular, in the host countries depends greatly on the human factor as well as the ability to implement advanced technologies brought by FDI, otherwise FDI will be ineffective. Furthermore, Alvarado et al. (2017) reveal that the low level of human capital may explain the negative FDI in the economies of Latin America. Lipsey and Sjöholm (2005) also argues that the host country can only receive the benefits of FDI if these countries have a highly qualified workforce. Therefore, the mechanism for the relationship between FDI and HCA is based on labour advantages, which are determined by several factors, e.g. skills, education, labour force structure, labour costs, and technology transfer. For instance, technology transfer is thought to occur through five channels: learning by watching, labour mobility, supplier contacts, customer contacts, and networking (Günther, 2002), amongst which the development of human capital and learning by watching are the most critical factors in determining economic growth (Balasubramanyam et al., 2019). Several previous studies focused on

the role of HCA in attracting FDI. One such example was research by Ramasamy and Yeung (2010), who examined a sample of 20 provinces in China. The empirical evidence shows that cheap labour attracts FDI, especially for inland provinces, while rising FDI inflow influences wage rates in the coastal provinces. However, the authors also noted that the benefits of cheap labour is only relevant in the short term. The favourable business climate, a suitable education policy, and incentives for increased R&D are long-term strategies to attract FDI inflows. Abbas et al. (2021) investigated a cross-sectional sample of 103 developing and transition countries, discovering that the wage bill is the most significant factor in attracting FDI. This implies that multinational corporations find cheap labour in the host country. Additionally, the authors observe no contradiction between enterprises seeking HCA and firms seeking inexpensive labour, meaning that FDI firms also obtain skilled labour. Kheng, Sun, and Anwar (2017) analysed data from 55 developing nations from 1980 to 2011, discovering a bidirectional causal relationship between HCA and FDI, meaning that FDI and HCA development strategies should be coordinated. Additionally, the authors highlighted the fact that governments should invest in HCA development by increasing education and training expenditures to achieve similar economic success to that of countries such as Brazil and China.

Dutta and Osei-Yeboah (2013) added the role of political rights and civil liberties in the relationship between FDI and HCA. Specifically, these two factors enable HCA to profit more efficiently from FDI inflows. Moreover, the existence of these two elements strengthens the correlation between HCA and FDI inflows. On the other hand, Zhuang (2017) showed that FDI from OECD nations had a favourable influence on secondary and university education in 16 East Asian countries from 1985 to 2010. The reason for this

is that FDI from the OECD countries may contain more advanced technology that demands more skilled labour. In other words, FDI stimulates the human capital in the host countries to meet the beneficial effects of receiving FDI from technologically advanced countries. Regarding the ASEAN region, previous studies indicated several factors that affect the FDI-HCA. Thangavelu and Narjoko (2014) emphasised the importance of the domestic absorptive capacity of the economies. ASEAN countries, therefore, ought to align their infrastructure, especially HCA, to provide multinational companies (MNCs) with the necessary linkages to the global network and also to move the domestic industries seamlessly up the global production value chain. Asada (2020) found that FDI in Vietnam contributes to HCA in the long run; albeit the relationship was ambiguous in the short run.

Based on these studies, a relationship between FDI and HCA may exist, inasmuch as

HCA plays an important role in attracting FDI inflows due to the abundant resources in the region. Additionally, countries in the region have a suitable labour structure that can meet the human resource requirements for multinational companies. In turn, FDI boosts a country's export quality by enhancing the domestic production capability. Therefore, the following hypothesis pertains to the relationship between FDI and exports given the presence of HCA:

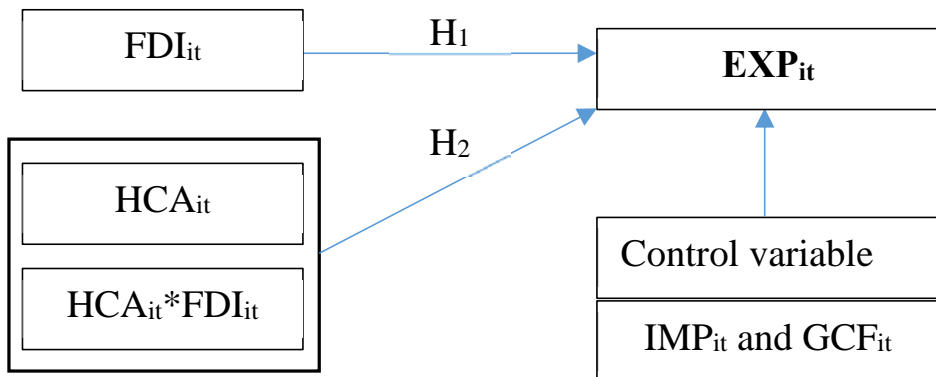
H2: HCA boosts the relationship between FDI and EXP in ASEAN countries.

2. Research model and data

2.1. Research model

To analyse and evaluate the role of human capital in the relationship between FDI and EXP, this study used a multivariable regression model to test the two research hypotheses as follows:

Figure 2. Overview of the research model



Source: Own elaboration

In which:

- EXP_{it} : Exports of country *i* at time *t*;
- FDI_{it} : the amount of foreign direct investment capital of country *i* at time *t*
- HCA_{it} : Human capital of country *i* at time *t*;
- HCA_{it}*FDI_{it} : the interaction between FDI and HCA of country *i* at time *t*;
- IMP_{it} : the import of country *i* at time *t* (the control variable) ;
- GCF_{it} : the Gross Capital Formation of country *i* at time *t* (the control variable).

According to this research model, besides determining the impact of FDI on EXP, HCA and HCA*FDI on EXP, there are also the control variables IMP and GCF. More

specifically, to test the first hypothesis, the study examined the multivariate regression FDI-EXP as follows.

$$EXP_{it} = + FDI_{it} + IMP_{it} + GCF_{it} + \quad (1)$$

where EXP and FDI are exports and foreign direct investment, while IMP and GCF are imports and gross capital formation, which play the role of control variables to measure the possible effectiveness of export values. $i = 1, 2, \dots, n$ represents the countries while $t =$

$1, 2, \dots, n$ denotes the period of examination, and denotes the error terms in the model.

To test the second hypothesis, the study investigated the equation to test the moderator as introduced by Baron and Kenny (1986).

$$EXP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 HCA_{it} + \beta_3 FDI_{it} * HCA_{it} + \beta_4 IMP_{it} + \beta_5 GCF_{it} + e_{1it} \quad (2)$$

where HCA denotes human capital, and FDI*HCA is the interaction between FDI and HCA. IMP and GCF are imports and gross capital formation, which play the role of control variables to measure the possible effectiveness of export values. $i = 1, 2, \dots, n$ represents the countries, while $t = 1, 2, \dots, n$ denotes the period of examination, and e_{1it} denotes the error terms in the model.

examined to confirm the reliability of the model.

2.2. Data measurement and data collection

Human capital (HCA) is proven to be the moderator if β_3 is significant. Additionally, the significant values of β_1 and β_2 reveal how the magnitude of the moderator affects the dependent variable.

Exports (EXP) were measured by exports of goods and services (% of GDP), indicating the total export values compared with the total GDP in a country within a year. The higher the EXP, the more open to trade a country is. Foreign direct investment (FDI) was calculated by the ratio of FDI inflows to GDP. The human capital variable (HCA) was indicated by the labour force participation rate, or the ratio of the workforce to the total population aged 15-64 (refer to previous studies for a similar approach). The labour force was a proxy for the HCA due to the available labour in a country, indicating the availability of labour to meet the needs of multinational companies. Imports of goods and services and gross capital formation measure the other two control variables, IMP and GCF, respectively. These two variables were also denoted by the ratio of GDP, capturing the possible effects on exports. These variables were derived from World Development Indicators for all nine ASEAN countries, i.e. Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, for 1990-2020. Due to a lack of

The Pooled Ordinary Least Squares model (Pooled OLS), fixed effects model (FEM), and random effects model (REM) were applied for the equations (1) and (2) to find an appropriate estimator, which captures the relationship between variables in the study. It is noted that the heterogeneous panel could affect the chosen appropriate estimator in the proposed model. To confirm the reliability of the results, the F-test to compare results between Pooled OLS and FEM estimators, and the Hausman test for the choice between FEM and REM were also employed (refer to Islam et al. (2020) and Siriopoulos et al. (2021) for a detailed discussion). In addition, the correlation and Wald tests are also

data in the same period, data for Myanmar was removed from the sample. In total, the data sample consists of 279 observations.

The measurement of the variables in the research model and the expected impact of these variables are summarised in Table 1.

Table 1. Measured Variables

Variable	Abbreviation	Description	Reference	Expected sign
Exports	EXP	Exports of goods and services divided by GDP (%)	Anwar and Sun (2018), Harding and Javorcik (2012)	
Foreign Direct Investment	FDI	The ratio of FDI inflows and GDP (%)	Prasanna (2010), Jawaid, Raza, Mustafa, and Karim (2016)	Positive
Human capital	HCA	Labour force participation rate (%)	Tebaldi (2011), Blanchard and Olney (2017)	Positive
Imports	IMP	Imports of goods and services divided by GDP (%)	Irandoost and Ericsson (2004), Feng, Li, and Swenson (2016)	Positive
Gross Capital Formation	GCF	The ratio of Gross Capital Formation and GDP (%)	Tebaldi (2011), Kabaklarli, Duran, and Üçler (2017)	Positive

Source: own elaboration

3. Results and Discussion

3.1. Description

The variables described in this study are shown in Table 2. The results reveal that the average export values in the ASEAN region for the period 1990-2020 were 66.63%, indicating that openness to trade in this region was relatively high. However, there is

a crucial difference between the maximum and minimum values visible, the former of which belonged to Singapore in 2008, while the latter was from Cambodia in 1990. Additionally, the standard deviation of the exports equals 48.94%, which is higher than the minimum value, indicating a considerable difference in exports between countries in the ASEAN region.

Table 2. Description of variables

	EXP	FDI	HCA	IMP	GCF
Mean	66.63%	5.41%	73.75%	63.16%	25.71%
Median	56.44%	3.44%	70.9%	51.24%	25.42%
Maximum	228.99%	32.17%	87.98%	208.33%	43.64%
Minimum	10.16%	-2.76%	61.77%	16.02%	7.92%
Std. Dev.	48.94%	5.82%	7.63%	41.31%	7.85%
Observations	279	279	279	279	279

Source: own elaboration

A similar trend is also found in exports, which has the same fluctuation in terms of FDI inflows, since there are significant disparities in high- and middle-income countries compared with lower-income countries. Specifically, Singapore continued to attract FDI when reaching a regional peak of 32.17% in 2019; meanwhile, Indonesia continuously demonstrated lower FDI inflows than outflows in 1999-2001. This suggests a correlation between exports and FDI inflows in ASEAN countries, in which countries with high FDI inflows are directly related to high levels of exports. It is also worth noting that Singapore is the leading country in the region in terms of both exports and FDI indexes, with an average value of 186.8% and 17.5%, respectively, both of which are more than three times the ASEAN average. This implies that countries with a high level of openness to trade achieve the dual goals of attracting FDI and increasing exports. For the HCA variable, a degree of uniformity in the mean, median and standard deviation imply that there is a certain similarity in the labour force in ASEAN countries.

3.2. Correlation of variables

Regarding the correlation test for the variables included in the proposed model, Table 3 shows that most of the variables are correlated at different levels of statistical significance. It is noted that one pair of independent variables has a high correlation coefficient at 1% statistical significance; for instance, $r(\text{FDI}, \text{IMP}) = 0.746$, indicating that there is a possible overlap between FDI and IMP. In other words, the model is likely to bear the risk of a multicollinearity problem. Therefore, the Wald test was undertaken to confirm the necessity of these two variables in the proposed model. The results reveal that the statistical significance F-value (FDI, IMP) = 25.94 at 1%, implying the rejection of the null hypothesis H_0 ($a = b = 0$). Furthermore, the variance inflation factors of each independent variable are lower than 5, indicating that there is no collinearity. In other words, the selected variables are eligible for presentation in the proposed model without facing the problem of collinearity.

Table 3. Correlation tests

	EXP	FDI	HCA	IMP	GCF
EXP	1				
FDI (2.47)	0.711***	1			
HCA (1.12)	-0.119**	0.205***	1		
IMP (2.43)	0.965***	0.746***	0.009	1	
GCF (1.07)	0.165***	0.119***	-0.141**	0.215***	1

*** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$. Values in parentheses present the centred VIF of each variable.

Source: own elaboration

3.3. Analysis of the hypotheses

3.3.1. The first hypothesis

The regression results derived from three estimation techniques, namely Pooled OLS, FEM and REM, on the relationship between variables are shown in Table 4.

Table 4. The relationship between FDI and exports

EXP is the dependent variable	Pooled OLS	FEM	REM
FDI	0.21* (1.04)	0.07* (1.87)	0.06* (1.68)
IMP	1.18*** (41.49)	1.09*** (36.24)	1.11*** (37.69)
GCF	-0.28*** (-2.79)	-0.71*** (-12.73)	-0.70*** (-12.72)
C	0.63 (0.23)	15.15*** (7.25)	14.76*** (3.25)
1 st test (F-value)	F-value = 107 > F-critical = 0.23		
2 nd test (Hausman test)	Chi-Sq. Stat = 3.73, d.f = 3, Prob = 0.29		

***p < 0.01, **p < 0.05, and *p < 0.1. t-statistics are in parentheses ().

Source: own elaboration

The regression results of Eq.(1) show that the statistical evidence supporting hypothesis H1 is weak (at a 10% significance level). Specifically, all three estimation methods, Pooled OLS, FEM and REM, reveal that FDI weakly affects exports within the ASEAN countries. Model selection tests were also applied to find the appropriate estimator. In particular, for the comparison between Pooled OLS and FEM (the first test), the F-value equals 107, which is larger than the F-critical value (0.23), implying the rejection of hypothesis H0: there is no difference between countries in the model. In other words, FEM is more suitable than Pooled OLS. For the comparison between REM and FEM models (the second test), the Chi-square statistic equals 3.73 with probability at 0.29, indicating no rejection of hypothesis H0: there is no correlation between the errors and the regressors in the model. In other words, REM is more appropriate than FEM.

Based on these findings, REM was chosen to present the obtained data set, and

some results derived from REM are as follows.

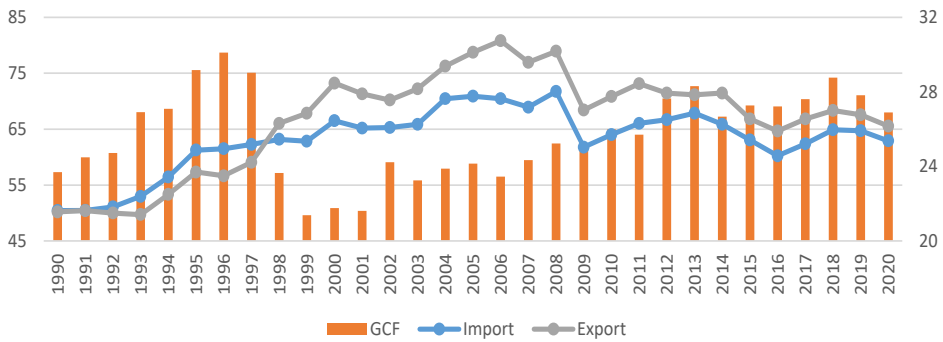
First, FDI inflows have a positive impact on exports. Our findings are in line with those of Prasanna (2010) in India, Jawaid et al. (2016) in Pakistan, and Anwar and Nguyen (2011) in the ASEAN region. The cause of this phenomenon can be explained by the fact that FDI inflows in the region directly serve export products. The increasing trend of export-oriented countries in the ASEAN region links FDI and exports in the region. For example, several Australian MNCs operate in only one nation, utilising it as a base from which to undertake business in other countries. For example, Treasury Wine Estates utilises Singapore as its headquarters for coordinating sales to other ASEAN countries, whereas Graincorp, a producer of grain and other commodities, operates a single sales office in Singapore for its exports throughout the ASEAN region (ASEAN & United Nations, 2021). However, it is also noteworthy that both the impact coefficients

and the amount of statistical evidence are relatively small, suggesting that boosting FDI does not lead to a significant increase in exports in the region. In other words, countries in the region need to consider their policies carefully if they promote exports through attracting FDI.

Second, exports are closely related to the two control variables in the model, namely imports (IMP) and gross capital formation (GCF). Specifically, EXP is strongly

positively correlated with IMP. Figure 2 also shows that during periods of the most substantial increase/decrease in exports, imports also increase/decrease accordingly, implying a solid relationship between them. The correlation suggests that trade openness-oriented policies, which aim to increase the production of export goods, need to gradually increase imports of raw materials, machinery, and equipment.

Figure 3. Evolution of Imports, Gross Capital Formation, and Exports in ASEAN, 1990-2020



Source: World Development Indicators (2022a, 2022c, 2022d)

In contrast, GCF shows a significantly negative impact on exports. The explanation for this phenomenon could be that the total domestic investment capital is not concentrated on the production of goods for export. Instead, GCF focused on other economic interests such as infrastructure development and domestic demand production. Thus, even during periods of a sharp decline in exports, such as during the global financial crisis of 2008-2010, GCF has remained at pre-crisis levels. The empirical evidence implies that increasing imports can boost exports; meanwhile, domestic capital could crowd out the effects of FDI on exports.

Third, since REM is a method suited to the dataset, implying that each country has distinguished characteristics for both

intercepts and slopes, in other words, the differences in the degree of reactivity between independent variables and exports indeed exist. Thus, it is necessary to consider the specificity of each country instead of a standard policy for all countries in the region. The difference (if any) is beyond the scope of this article. One may therefore suppose that additional variables are needed in the following studies to measure the responsiveness of one or more variables that can affect exports.

3.3.2. The second hypothesis

The regression results derived from three estimation techniques, i.e. Pooled OLS, FEM and REM, testing the moderator role of HCA in the relationship between FDI and exports, are shown in Table 5.

Table 5. The moderator role of human capital in the relationship between FDI and exports

EXP is the dependent variable	Pooled OLS	FEM	REM
FDI	0.15 [0.08]	7.06*** [6.38]	7.06*** [6.49]
HCA	0.96*** [7.12]	0.58** [2.11]	0.76*** [3.17]
FDI*HCA	0.01 (0.26)	0.09*** (6.45)	0.09*** (6.59)
IMP	1.13*** [42.68]	1.11*** [37.87]	1.11*** [40.20]
GCF	-0.39*** [-4.56]	-0.69*** [-13.02]	-0.69*** [-13.20]
C	74.5*** [7.54]	57.26*** [2.76]	70.29*** [3.84]
1 st test (F-value)	F-value = 84 > F-critical = 0.23		
2 nd test (Hausman test)	Chi-Sq. Stat = 1.06, d.f = 5, Prob = 0.59		

***p < 0.01, **p < 0.05, and *p < 0.1. t-statistics are in parentheses ().

Source: own elaboration

The regression results of Eq. (2) show solid statistical evidence supporting hypothesis H2 at a 1% significance level. Specifically, FEM and REM methods both show the impact of the interaction variable (HCA*FDI) on the exports of ASEAN countries. In addition, the FDI coefficient on exports in the presence of HCA in both FEM and REM reached 7.06%. In other words, human capital promoted FDI with a more substantial effect on exports. This implies that human capital is a moderator in the FDI-Exports nexus. The finding contributes to the literature that the HCA bolsters the FDI-Exports nexus, since its presence may influence the magnitude of the effect of FDI capital on exports.

Model selection tests were also applied to find the best estimation method. Specifically, for the comparison between the Pooled OLS and FEM (in the first test), the F-value equals 84, which is larger than the F-critical (0.23), implying the rejection of the null hypothesis H0: there are no differences among countries in the model. In other words, the FEM model is more suitable than Pooled OLS. Regarding the comparison between REM and FEM (in the second test), the Chi-square statistic equals 1.06 with probability at 0.59, indicating the rejection of hypothesis H0: there is no correlation

between the errors and the regressors in the model. In other words, REM is more appropriate than FEM. From these results, REM was chosen for further analyses on the obtained data set, and the present interpretation was drawn from REM as follows.

First, the results from the regression model show that HCA plays a role in enhancing the FDI-EXP nexus in ASEAN countries. The study also compares the magnitude of the FDI impact on exports in Eq.(1) and Eq.(2). The results show that the presence of HCA has made FDI have a more substantial effect on exports in the region. In detail, if FDI increases by 1%, then exports only increase by 0.07% in Eq.(1); meanwhile the ratio is 1:7.06 in Eq.(2), showing that the impact of FDI on exports increases significantly in the presence of HCA. This also suggests that FDI in the region flows into intensive labour export industries. Our findings support hypothesis H2 that in ASEAN countries, where the labour force is abundant, export flows will benefit from FDI inflows into the region. Our findings are in line with those of Thangavelu and Narjoko (2014) and Zhuang (2017) on the importance of HCA in attracting FDI. In addition, the present study adds the moderating role of HCA in the FDI-EXP nexus to the literature.

Second, the REM estimation method is suited to the data, which measures the moderating role of HCA. Thus, similarly to the results in Eq.(1), each country is different in terms of both intercepts and slopes, implying that the degree of reactivity between independent variables and exports is distinguished. Therefore, it is necessary to consider the specific policies of each country rather than for all standard policies applied to all countries in the region. The differences in each country's labour structure can affect the level of impact on FDI inflows both directly and indirectly. Subsequent studies may measure the response of exports to FDI and HCA in order to identify other factors which potentially explain these differences.

Conclusions

The study analyses the relationship between FDI, HCA, and EXP by means of quantitative analysis based on the panel data estimation for nine ASEAN countries within the period 1990-2020. Three estimation methods, namely Pooled OLS, FEM, and REM, were applied to examine the proposed model. At the same time, reinforcement tests were also employed according to the proposed hypotheses. The empirical results show that FDI inflows have a significantly positive effect on exports in the region. Although the impact is small and the statistical evidence is weak, it is crucial to recognise the importance of attracting FDI in the region to promote export production and the associated benefit to individual national economies. More interestingly, the main contribution of this study points to the mechanism of the reinforcing effect of HCA on the FDI-EXP nexus, which still represents a gap in the current literature. The statistical evidence suggests that the reinforcing effect is present and relatively straightforward in terms of coefficient effect and statistical levels. Specifically, ASEAN is a region with abundant labour resources with reasonable prices

compared to other regions. Accordingly, the presence of HCA strengthens the impact of FDI on exports. In other words, FDI inflows are also channelled into labour-intensive export manufacturing industries. Therefore, this advantage is still a crucial factor within the region. Policies focusing on attracting FDI should be associated with the structure of labour resources. As a result, countries need to pay attention to the local labour resources in order to meet production requirements, which have increased sharply in recent years.

In addition, exports are also closely correlated with two other factors, namely imports and gross capital formation, in which an increase in imports supports exports; meanwhile, domestic capital tends to be inversely related to exports. This evidence suggests that export-promoting FDI access policies need to be adequately optimised so as not to overlap with domestic capital, not supporting exports. Econometrics exercises show that REM estimation applies to both Eq.(1) and (2), implying that individual countries have different responses regarding the FDI-EXP nexus and the moderating role of human capital. As a result, policies which aim to attract FDI based on human capital advantages that promote exports need to be carefully designed following the labour structure for each country.

However, due to this being beyond the scope of the present research, the present study has not classified the categories of FDI inflows, which may individually affect the relationship between FDI and exports. For example, industry-oriented FDI capital has different effects on exports compared to service/infrastructure-oriented FDI capital. Furthermore, the chosen method (FEM) has not provided statistical evidence for amending policies for each individual nation. Future research may consider both limitations presented in this study in order to more deeply analyse the FDI-exports nexus.

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