

The International Trade, Foreign Direct Investment and Economic Growth: ASEAN Perspective

Danial Thaib^a, Yusro Hakimah^{b*}, Yolanda^c, ^aFaculty of Economics, Institute of Business and Informatics Kosgoro 1957, Jakarta, Indonesia, ^bFaculty of Economics, Universitas Tridianti Palembang, Palembang, Indonesia, ^cFaculty of Economics, Universitas Borobudur, Jakarta, Indonesia, Email: ^{b*}yusrohakimah@yahoo.co.id

This research proposes to answer the question as to whether International trade and Foreign Direct Investment (FDI) have effects on economic growth over time in ASEAN or not. International trade is often seen as a catalyst for economic growth. This study will contribute to the current literature studies based on development economics. The research will differentiate between some views on the association of FDI, exports, and economic growth. Second, many empirical studies are based on cross-sectional data covering different groups of countries. Sometimes the critics of those studies ignore the difference between the parametric variation. If a single country is used, the difference should be less than the cross-country analysis and it may get more significant results. This paper extends the previous empirical studies on the issue by providing some evidence from time-series data, of the period over 1990-2017, of ASEAN countries. The error correction model is used to investigate the response of the system to economic shocks; the results showed that, the country's economic growth is influenced by its lagged values of GDP. Finally, this paper draws some policy implications for the further studies to focus on the economic growth in China, to ensure that economic growth would not drop.

Key words: *ASEAN, FDI, Economic growth.*

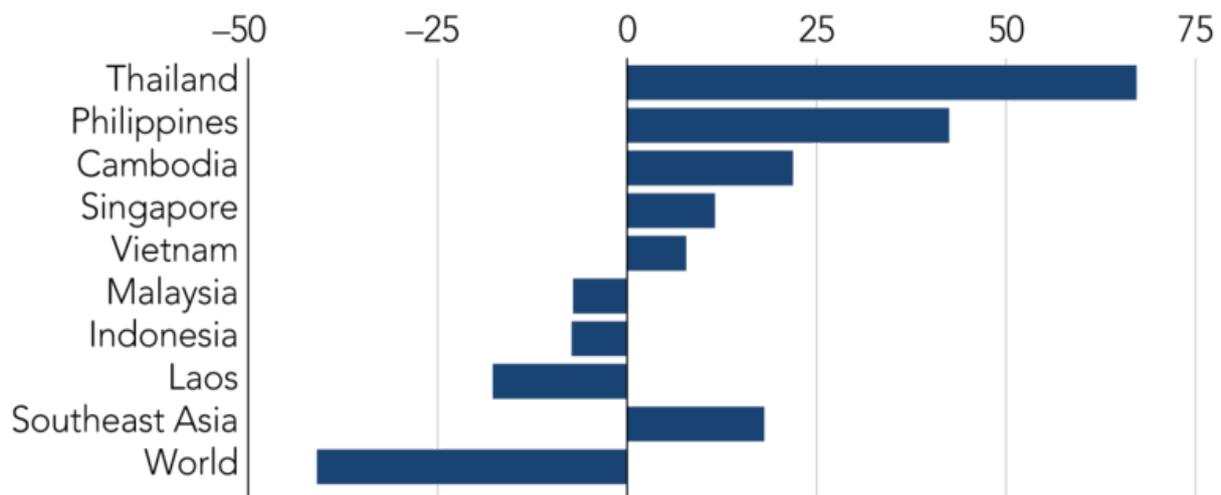


Background

Trade openness plays an important role in economic growth in many countries. International trade in the nineteenth century and early twentieth century, generally encouraged the growth of the developed countries of today, and it has often been referred to as the “engine of growth”. The growth of domestic demand, rapid expansion of trade, particularly in the export sector, led to the creation of large-scale industry to provide a further stimulus. The level of permission to the countries for trade is referred as trade openness. It can be regarded as the level of trade of a country with other economies. FDI, imports, and exports, lending, borrowing and repatriation of international funds are included in the activities of trade. Greater opportunities are availed by economies with trade openness. Similarly, such economies experience higher international competition. These countries get a way for acquiring international funds through trade. The investment is made from surplus in other countries. The reforms have been implemented by ASEAN in stages. The role of ASEAN in international trade has increased, which increased the interest in world countries. The domestic investments attribute the growth of ASEAN in the large-scale infrastructure. There is an exaggerated role of heavy industry and exports in the economy. The Government of the People's Republic of ASEAN has taken the decision to allow international companies of ASEAN to export in other countries such as Malaysia, South Korea, Asia, and Singapore (Chiu, 2018).

The government also has focused on foreign trade as a major vehicle for economic growth. It has contributed to economic restructuring and the resulting efficiency of more than a ten-fold increase in GDP since 1978. ASEAN increased integration with the international economy and the growing efforts to use market forces to control the internal distribution of goods. Over the years, large subsidies were built into the price structure, and this has grown dramatically in the late 1970s and the 1980s and later. From the early 1990's, the subsidy was eliminated, mostly due to the entry into the World Trade Organisation (WTO) in 2001 by economic liberalisation (Daugbjerg, 2017). The absorbed structural change of rising income and liberalisation, with the pace forced by the expansion of trade and investment in ASEAN, helped the current era of rapid growth in developing Asia to become a healthy, developing country. Trade liberalisation and strong output and import growth in ASEAN have helped the country to maintain its commitment to growth-oriented policies. Sustained, rapid economic growth has allowed ASEAN economies to catch up with advanced industrial economies more quickly. The continued rapid growth and structural change increases incomes and real exchange rates. The most dramatic change in ASEAN, is now growing faster than any of its neighbours in their periods of strong growth. It is evident from figure 1 that the FDI growth in the majority of ASEAN countries is positive and these countries have performed well on average with the world FDI.

Figure 1. FDI growth in ASEAN (2018)



Source: UNCTAD, Mizuho Research Institute

It is easier to give incentives rather than imposing measures for controls. Therefore, it is better to option for an export-oriented strategy. The national income can be increased by this strategy. Several countries are working on the promotion of exports and protection of other sectors, and the strategies for promotion of exports and substitution of imports are complementary. It is important to substitute imports for achieving growth from exports (Dass, 2018). The export base of ASEAN has become greatly diversified because of its dependence on light manufacturing and textiles. In recent years, the exported products include clothing, footwear, toys, and some miscellaneous manufactured articles. Therefore, substantial gains have been made by ASEAN in some export segments such as industrial supplies and sophisticated electronics.

An import substitution strategy can be, for example, trade barriers, due to the penetration of foreign consumer goods; this will lead to market competition. ASEAN is focusing on import advanced technology and equipment. While an export-oriented industry benefits both the domestic and export market, it is also easier to monitor the relative effectiveness of export promotion policies. In the past one decade, foreign direct investment (FDI) in ASEAN has been one of the great successes. Through openness of trade and FDI, ASEAN can quickly absorb and digest the advanced technology in the world, so as to realise the upgrade of technology, innovation and breakthrough. The per capital growth income has increased from FDI inflows and domestic investment in ASEAN across the regions of ASEAN. Moreover, the increase in economic growth of coastal areas is related with large percentage of foreign investments (Samimi, Sadeghi, & Sadeghi, 2017). The increased average income of the region is affected by FDI. International trade and simultaneous FDI expansion are important indicators of integration in ASEAN.

The degree of technical complexity of ASEAN's export products is continuously rising. In other words, ASEAN's technological progress cannot be separated from an open environment. To enhance export and actively expand imports, it is essential to continue to increase the degree of ASEAN's international trade. Also improving on FDI is very important in the next round of economic growth in ASEAN. The main objective of every economy is development, which is crucial for economic growth. In recent years, trade openness or trade liberalisation is rapidly becoming one of the current trends in the world, especially in developing countries. The economic growth model proposed is that it is possible to establish a relationship between international trade, FDI and economic growth. From the previous empirical studies, it is claimed that, outward-oriented countries have greater growth rates compared to the inward oriented economies. There is also concern about trade, especially between the primary and industrial goods' exporting countries.

The influence of international trade on growth of economy is not clear. It has been supported by most of the empirical studies that exports result in economic growth. However, there is no conclusive argument on this. It has been agreed by some economists that economic growth is improved by exports (Hong, Yen, & Chien, 2019; Murinde, 2017; Tumwebaze & Ijjo, 2015). Alternatively, some did not find support for a positive influence of exports on economic growth (Konstantakopoulou, 2016; Sothan, 2016). It was found by Kumar (2018) that a critical exports' level exists in economic growth. Cross-sectional data has been used by some researchers for empirical analysis. Therefore, the results vary for every country.

By using cross-sectional analysis, it is difficult to determine parametric differences between economies even if the sample seems homogenous (Paleologou, 2016). A fallacy composition is suffered by the growth based on exports, because it cannot be pursued by developing economies simultaneously. Therefore, it is important to know the influence of exports on growth of ASEAN using the time series data. As previous studies have pointed out, it is important to study the effects of exports. If it is found that promotion of exports does have a positive effect on economic growth, the government may accelerate the value of exports and expand international trade. This study used the latest data over the time period from 1980-2010, and the final results may help to improve our studies.

A supportive role is played by export in the growth of economy. This notion is important to be determined. It is under debate among the policy makers and economies of the civil society. In recent years, the significance of this issue has increased and is relevant to the current conjuncture. International trade plays a key role in the development process. It is related to long term policy as the decision is taken by the emerging economies about their openness to the world countries.

This study is primarily to investigate the importance of exports, imports and FDI on economic growth in one framework. This would answer the question whether these variables have effects on economic growth over time in ASEAN or not. International trade is often seen as a catalyst for economic growth. The study will contribute to the current literature studies based on development economics. The research will differentiate between some views on the association of FDI, exports, and economic growth.

Secondly, many empirical studies are based on cross-sectional data covering different groups of countries. Sometimes the critics of those studies are ignoring the difference between the parametric variation. If one uses a single country, the difference should be less than the cross-country analysis and I may get more significant results. Thirdly, a studying of the ASEAN experience is useful. From the experience of ASEAN, the analysis provides some policy implications for the other former developing countries which shared the similar economic system as ASEAN, but is now experiencing slower economic growth. Analysis of the relationship between international trade and economic growth from ASEAN may raise an effort to help these countries to develop their international trade and economic policy. Finally, the result of this study would be potentially useful for a government policy maker as a guide in implementing an appropriate policy, concerning international trade, FDI, in order to stimulate and sustain ASEAN's economic growth. This paper focuses on the relationships of international trade on economic growth using the timeseries data over the period from 1980-2010 for ASEAN. A study of the ASEAN's experience is useful, because it can provide some policy implications for developing countries and may show how exports affect economic growth in a large country.

The existing studies, which worked on cross-country growth regressions, can be used to recognise the variables influencing growth. The variables, which on average appear to be important, are highlighted by the cross-country studies. The process can be understood through an analytical country that can help in identifying the important factors in individual economies (Shiller, 2017). The approach of cross-country is not beneficial for a specific economy and it is difficult to achieve the policy implications relevant to the country (Audretsch & Lehmann, 2016). It is a key limitation as the factors or policies, which are suitable for a specific economy, may not be suitable for another (Siddiqui & Rehman, 2017).

Literature Review

It is implied by the hypothesis of export led growth that economic growth can be increased by an increase in the level of exports. The role of exports on growth of the economy is not a new concept. It has emerged since the theories of classical economics were developed by David Ricardo and Adam Smith. The economists argued that a crucial role is played by international trade in the growth of economy. The economies of scale and labour specification are enabled

through trade. A useful framework is provided by several studies to analyse the relation between export and economic growth (de Pineres & Ferrantino, 2018; Musila & Yiheyis, 2015). The concept used in these studies is the increase in productivity through exports. Exports create an influence on transfer of technology, economics of scale, improvement in workers' skills and capacity of the country.

The role of free trade in improving technology has been emphasised by Chu, Furukawa, and Ji (2016). Smaller countries are allowed for technology absorption in advanced countries with greater level of openness as compared with the countries having low level of openness. It has been argued by SAĞLAM and EGELİ (2017) that trade expansion can be caused by growth in economy. Feedback effects can be created to exports from growth.

It has been shown that economic growth can be caused by exports in different ways. For instance, it may occur as economies of scale, utilisation of large capacity, foreign competition and its pressure, technological improvements, which ultimately result in efficient management. Therefore, the marginal factor productivity is high in export industries as compared with the non-export ones. It was estimated that there is an increase of 1.3 percent in productivity because of a 10 percent increase in exports. Causality tests were applied by Yüksel and Zengin (2016) using a sample of 73 under-developing economies to find the relation between economic growth and exports for the years 1960-1977. The research found that an important determinant of economic growth is performance of exports (Basheer, Siam, Awn, & Hassan, 2019). Some recent researchers have worked on long periods with time series econometrics to analyse the relation between economic growth and exports. However, these studies have failed to find support for the promotion of development strategy by exports.

The lag and lead-time patterns were analysed by Raeni, Hosseini, and Moghaddasi (2019) between real growth rate of exports and real output growth emerging economies. It was done individually for Egypt, Ecuador, Egypt, and Indonesia. The researcher found that promotion could be done by exports. Data for more than 80 economies was used by Ighodaro and Ogbomo (2018) for the years 1961-1986. It was found that a weak support has been offered by the granger causality test to trade led growth notion. An important topic for debate in the studies on development economics is the influence of export performance on FDI.

It was pointed by Qamruzzaman (2015) that exports from host countries could lead FDI if outward-oriented export promotion is successful. In addition, the argument of causality from export to FDI can also be rationalised from the supply side. The causal association between export, FDI, and imports was investigated by Gunby, Jin, and Reed (2017) for ASEAN using the Granger causality test. The study used panel data based on 19 regions of ASEAN for the years 1984-1998. It was found that the inward stock of FDI in ASEAN has a one-way causal relation with growth. The influence of export expansion and FDI on the growth of GDP was

analysed by Osho and Adishi (2019) for 29 ASEAN provinces. The researcher found that there exists a relation between FDI, exports expansion, and growth of GDP. However, this relation is based on the social and economic structure of the regions such as industrial structure, development level, openness, and policy orientation.

There is no influence of exports on the growth of economy without achieving comparative advantage, a specific development level, and outward policy. Therefore, it does not influence growth. It has been confirmed by the differential influence of foreign investment and exports, along with divergent performance growth, that a crucial role is played by inflows of FDI on economic growth through open policy.

A causal and direct relation is pointed to, by standard economic theory, between economic growth and international trade. The relation can occur in both directions. Alternatively, the flow of FDI can be generated by the host economy, when it offers a considerable market for the consumer. In this case, FDI acts as an alternative for trade of commodities. Contributions can be made by FDI in the host country through expansion of capital stock of the country, increased transfer of technology, acquisition of skill and improved competition in the domestic industry. Several studies have confirmed the positive influence of economic growth on inflows of FDI (Agiomirgianakis, 2017; Asghar, 2016; Vo, 2018). Positive and negative effects are created by FDI on growth of the economy. The distribution of human capital wage is greatly affected by FDI, when it is the main wage distribution such as the wage distribution between workers (skilled and unskilled). When the host country has a minimum standard of human capital stock, the technology is influenced by FDI as claimed by Iamsiraroj (2016).

Evidence has been provided by Iamsiraroj (2016) and Arif, Khan, and Ali Raza (2018) that significant gains are acquired from FDI by the financial markets in terms of economic growth, which are well developed. It has been implied by a large number of studies that the specific role of human capital in brining FDI is advantageous for host countries. The human capital contributes to the economic growth, which is a controversial issue. Primary and secondary enrolment rates were used by Barro (1991), Neeliah and Seetanah (2016) to show significant and positive influence. An insignificant result was found by Boutayeba and Ramli (2019) for human capital stock (means number of schooling years)

The increment of the share of FDI is related to the plant productivity in some countries, in a positive way.

Therefore, the multinational organisations have higher value of the labour productivity than the domestic organisation. FDI also increases the demand for skilled labour which leads to the rise of the total wages of skilled labour. This is because the multinational organisations usually have more skilled labour than the other economies. A growth model was formulated based on

Sunde (2017) specification. The model was in linear form to analyse the influence of human capital and FDI on economic growth empirically. A similar model of endogenous growth was presented by Sunde (2017), in which a positive influence on growth is created by FDI. The growth is influenced by FDI through human capital accumulation. The human capital level is positively linked with the influence of FDI on rate of economic growth. When the human capital level is high in the host economy, the influence of FDI on growth of economy is higher.

Model

The development of the neo-classical growth theory was made to define growth of economy. This is because it has been set with the industrial economy's context. Labour and capital are the two main production factors. The growth theory is linked with the way in which labour growth influences the output growth along with influence of investment on growth of capital stock (Sundrum, 1990). The Solow model represents the theory of neo-classical growth.

The Solow model shows the neo-classical framework of long run growth. It is implied by the growth model that the focus is on the relation of economic growth rate and investment and aggregate production function. A single good is produced using capital and labour in a closed economy (basic Solow model) (Wahyudi & Jantan, 2012). The labour (L) and capital (K) are the inputs in production function that are required for output produced (Y). By using the production function of Cobb-Douglas:

$$Y = F(K, L) = CAP^\alpha * Lab^{1-\alpha} \dots (1)$$

Where, $0 < \alpha < 1$

Constant returns to scale are shown by this production function. Therefore, output is doubled when the inputs are doubled. The production is given in terms of per worker output and per worker capital, as shown below:

$$y = \frac{Y}{Lab} \dots (2)$$

$$k = \frac{CAP}{Lab} \dots (3)$$

More per worker output will be produced when there is more per worker capital. The way in which capital is accumulated in the country is shown by the Solow model's equation. Following is the equation of capital accumulation:

$$C\ddot{A}P = sY - dCAP \dots (4)$$

CAP represents the change in stock of capital, T represents the gross investment difference, and dCAP is depreciation as per the equation. It is assumed by the model that a constant fraction is saved by workers, s, for their rental income and combined wage. Investment is equal with savings as the economy is closed. Capital is accumulated by investment because the economy is closed, savings equals investment and investment is used to accumulate capital. Depreciation happens every period no matter of how much output is produced. The capital accumulation equation in per worker terms:

$$\dot{CAP} = sY - (n + d)CAP \dots\dots (5)$$

The Solow model can be solved by taking the capital accumulation and production function together. $y=CAP$ shows the production function in per worker output. When the two curves intersect each other, the equilibrium is formed. When $cap=0$, the per work capital quantity in a steady state is determined. It suggests that no change occurs in the ratio of capital-labour with time. Therefore, the economy comes at a steady state. When the alternative production function is used in terms of per worker output i.e. $y=kin$, the accumulation of capital equation in terms of per worker is shown as $CAP=sy-(n+d)cap$

The quantity of per worker capital is found at a steady state by setting this equation equal to zero.

$$cap^* = \left(\frac{s}{(n+d)}\right)^{\frac{1}{1-\alpha}} \dots\dots (6)$$

By substituting (3.3) into the production function (3.1), one may get the steady-state output per worker:

$$y^* = \left(\frac{s}{(n+d)}\right)^{\frac{1}{1-\alpha}} \dots\dots (7)$$

The empirical observation fits with the findings of Solow model, which states that different per capita incomes are owned by countries. However, it is not explained about the continuous growth of economies for long time periods. Technological progress, growth of population, and saving rate have been taken as explanatory variables. Labour and capital are two inputs. These inputs are paid as per their marginal productivities (Mankiw, Romer, & Weil, 1992). A is referred as technology variable, which has been used for technological progress in the function.

$$Y = F(K, ALab) = CAP^\alpha * ALab^{1-\alpha} \dots\dots (8)$$

It means by the technology variable that with higher technology levels, labour becomes more productive. The ratio of per worker capital to technology is represented by the variable. Therefore, it means that productivity of labour is improved with the use of technology.

The production function has been rewritten as: $y^* = CAP^\alpha$ which represents the function of capital accumulation. With time, there will be increase in capital-technology ratio, when the economy is less than the level of a steady state. This is because of the investment amount is greater than the required level to maintain a constant ratio of capital-technology.

This condition is true until the point

$$y^* = (n + tec + d)CAP^\alpha \dots\dots (9)$$

The economy is in a steady state and grows at the rate of technological progress. Using the same method as the Solow model without technology, $cap = 0$, one may find that,

$$cap^* = \left(\frac{s}{(n+tec+d)}\right)^{\frac{1}{1-\alpha}} \dots\dots\dots (10)$$

Following the equation after substituting values in the production function and in per worker output:

$$y^*(t) = A(t)\left(\frac{s}{(n+tec+d)}\right)^{\frac{\alpha}{1-\alpha}} \dots\dots\dots (11)$$

Resultantly, the output is based on time. Therefore, the growth of economy improves with improvements in technology. Therefore, technology, growth rate of population, and rate of investment determines per worker output.

The neoclassical model was extended by Lucas (1988) through the assumption that time is spent by individuals for skill improvement such as going to school. The Solow model has the simple assumption for labour, which can be changed by incorporating human capital. It is referred as the education and skills of workers. The Solow model including human capital (h) has been shown as:

$$Y = CAP^\alpha (hLab)^{1-\alpha} \dots\dots\dots (12)$$

Technology is still assumed to grow exogenously at rate, g. However, in this economy individuals accumulate human capital by spending time learning new skills. Thus, if an individual 1-u devotes fraction of time learning, then,

$$\hat{h} = (1 - \phi)h \dots (13)$$

The solution to the neoclassical model with human capital in a steady state is similar to the simple version of the Solow model. Assume the parametric is constant and exogenously determined, so that the capital accumulation equation can be written as:

$$cap^* = s\hat{y} - (n + tec + d)\widehat{cap} \dots (14)$$

Since, adding human capital does not change the basic predictions of the Solow model, by setting and substitution, one can find an equation in terms of output per worker,

$$y^*(t) = h(t) \left(\frac{s}{(n+tec+d)} \right)^{\frac{\alpha}{1-\alpha}} \dots (15)$$

This solution suggests that, the extended Solow model explained why some countries are rich and others are poor. Some countries do well because they have high investment rates in physical capital, low population growth, higher technology level and spend a most of time accumulating human capital. In the steady state, though, this extended Solow model still predicts that per capita output grows at the rate of technological progress, as in the simple model. It is clear, therefore, that the main determinant of long-run growth is technological progress. However, it is known as the variable outside of the neoclassical model. In short, the theory of economic growth suggests that the potential determinants of a country's economic growth are capital, labour, technology and human capital. Thus, in evaluating the impact of international trade and FDI on economic growth, we need to control the variable of capital, labour, technology and human capital. The econometric models to examine in this study take economic growth as dependent variable, and FDI, exports, imports and human capital variables are considered as independent variables. In the attempt to determine the relationships between economic growth and exports, FDI in ASEAN, the general model of this study is specified as:

$$EGr = f(\text{FDI, Exp, Imp, Edu}) \dots (16)$$

Here:

EGr = current GDP as a measure of economic growth (million US dollar)

FDI = foreign direct investment (million US dollar)

Exp = ASEAN exports (million US dollar)

Imp = ASEAN imports (million US dollar)

Edu = total school enrolment (people)

Then, in the next section, the aim is to explain the relevant econometrics procedures in testing time-series data. The most appropriate estimation techniques will be discussed under various conditions to achieve the objective of this study.

Estimation

The stationary condition of the variables is tested by unit root test. Mostly, the researchers employ time series data and it is important to check whether the stationary condition exists in data or not, in order to reject alternative hypotheses. The ADF test has been used for checking the unit-root test (Dickey & Fuller, 1981). It analyses the integration order of every variable. From the perspective of econometrics, spurious regression can be resulted by a model with non-stationary variables. In order to avoid this situation, it is important to check the unit root for time series data for every variable used in the research model. A formal treatment was given to co-integration in Engle and Granger (1987). This makes the regressions with variables integrated of order 1 meaningful. The long run association between the variables is determined along with co-integration test.

If two or more than two variables are related with each other to form long run equilibrium, the variables are co-integrated. Moreover, the variables are stationary at a similar integration order. The variables are integrated of order 1. When the variables are not stationary at level, their first difference is taken to make them stationary. If the variables are not stationary at the first order, the second difference of variables is taken to make them stationary. The variables, which become stationary at the second difference, are integrated of the second order.

The co-integration equation is referred as stationary linear combination (Engle & Granger, 1987). The approach proposed by Johansen was used for checking co-integration (Johansen, 1988). An estimation process with maximum likelihood was developed by Johansen, which allows the testing of multiple co-integrating relations. Several co-integration tests exist but the Johansen test is considered most suitable. This technique treats all the variables as dependent variables. When the null hypothesis is rejected, it means that a long run association exists among the variables. The test of co-integrating vectors is involved in the Johansen approach.

$$Y_t = \Pi_1 Y_{t-1} + \Pi_2 Y_{t-2} + \Pi_3 Y_{t-3} + \Pi_4 Y_{t-4} + \dots \dots \dots \Pi_k Y_{t-k} + \varepsilon_{it} \dots (17)$$

Here, Y_t represents the stochastic variable's $N \times 1$ vector, $\Pi_1, \Pi_2, \dots, \Pi_k$ represents $n \times n$ parameter, and ε_t shows random error term. If the Y_t is stationary, we can write the above equation as follows: $\Pi_1 \Delta Y_{t-1}$

$$Y_t = \Pi_1 \Delta Y_{t-1} + \Pi_2 Y_{t-2} + \Pi_3 Y_{t-3} + \Pi_4 Y_{t-4} + \dots \dots \dots \Pi_k Y_{t-k} + e_{it} \dots (18)$$

Where, $\alpha_i = -[1 - \alpha_1 - \alpha_2 - \dots - \alpha_i]$

$i=1,2,3,\dots,k-1$

α represents the adjustment parameters in ECM. It reflects the co-integration vector. The long run relation between the variables is checked in this process. The main variables involved in the study includes FDI, economic growth, and exports. It is crucial to check the long run stationary relation between the series. Otherwise, it can result in misspecification, which can underestimate the validity of estimates of the parameter. Therefore, spurious regression can be avoided through the co-integration test (Engle & Granger, 1987).

The long run characteristic of the research model is considered in co-integrating regression. The short-term changes are not considered. The short-term changes and long-term equilibrium are described in a good time series. ECM needs to be developed for this. The assumption of an equilibrium relation exhibited by two or more time series is included in ECM, which determines the behaviour in short and long run. The short-term dynamics are integrated in ECM without losing long run information. When the variables are not co-integrated and stationary at the first difference, a dynamic model can be estimated in first differences. This has been shown as below:

$$\Delta y_t = \alpha_0 + \alpha_1 \Delta y_{t-1} + \beta_0 \Delta x_t + \beta_1 \Delta x_{t-1} + u_t \dots \dots (19)$$

where Δy_{t-1} , and Δx_{t-1} has zero mean given, and further lag. If these are cointegrated with parameter β , then we have additional $I(0)$ variables that we can include in equation (19). Let $S_t = y_0 + \beta x_t$, so that is $I(0)$, and assume has zero mean. If we include one lag of S_t :

$$\Delta y_t = \alpha_0 + \alpha_1 \Delta y_{t-1} + \beta_0 \Delta x_t + \beta_1 \Delta x_{t-1} + \phi(\Delta y_{t-1} - \beta x_{t-1}) + u_t \dots \dots (20)$$

An error correction model allows us to study the short-run dynamics in the relationship. If one considers the model without lags of Δy_t and Δx_t , then:

$$\Delta y_t = \alpha_0 + \beta_0 \Delta x_t + \phi(\Delta y_{t-1} - \beta x_{t-1}) + u_t \dots \dots (21)$$

The Granger Causality Test is used to see the causal relationship between the variables studied, namely economic growth, FDI, export, and import. By testing to see whether the two variables have a relationship of mutual influence (two-way relationship), have a direct relationship or no relationship (no interaction). The base model is as follows:

$$\Delta \ln RGDP_t = \alpha_1 + \sum_a \theta_1(i) \Delta \ln FDI + \sum_b \theta_1(i) \Delta \ln EXP + \sum_c \rho_1(i) \Delta \ln IMP + \Delta ECT_{t-1} + \varepsilon_{it} \dots \dots (22)$$

Results

The data has constant value for mean and variance with time, and it is regarded as stationary (Enders, 2004). The initial step is to check the integration at level. The past shocks create an undiluted influence and there is infinite variance and mean based on time; this is referred as integration. The test recommended by Dickey and Fuller has been used in this study to check the unit root properties for variables (ADF, 1979, 1981). When the variables are not stationary at level, these can be made stationary at first difference using similar lags level.

The results of the correlation test between a dependent variable and an independent variable proved to be very useful in pre-estimation analysis especially in regards to potential relationships suggested by theories. Therefore, prior to the econometrics analysis, the statistical correlation of the variables are examined which helped in determining the statistical relationships between and amongst the variables.

Table 1: Correlation Analysis

		1	2	3	4
<i>RGDP</i>	1	1			
<i>FDI</i>	2	0.830**	1		
<i>EXP</i>	3	0.257**	0.243**	1	
<i>IMP</i>	4	0.810*	0.118**	0.829*	1

The study also performed the unit root test to estimate the deviation series for each economy. Rejecting the null hypothesis that the series does not contain a unit root supports convergence. In order to justify the assertions made regarding the superiority of SURADF as against traditional ADF as well as other techniques for performing unit root test, results for traditional ADF test for stationarity were reported alongside the chosen SURADF for each of the 5 series. Results for the tests on deviation series from ASEAN average real poverty are presented in Table 2.

Table 2: Seemingly Unrelated Regression Based Augmented Dickey-Fuller Unit Root Test

$y_i - \bar{y}_t$	<i>t</i> -statistic		SURADF critical values		
	ADF	SURADF	0.01	0.05	0.10
$(y_i - \bar{y}_t)$ Indonesia	-2.748[1]*	-2.974[1]*	-2.404	-4.399	-1.804
$(y_i - \bar{y}_t)$ Malaysia	-3.073[1]*	-2.150[1]*	-3.140	-2.047	-2.451
$(y_i - \bar{y}_t)$ ASEAN	-1.111[1]*	-2.624[1]**	-4.858	-3.997	-1.509
$(y_i - \bar{y}_t)$ Singapore	-2.526[2]**	-3.570[2]	-3.381	-2.268	-2.707
$(y_i - \bar{y}_t)$ Philippine	-0.874[1]	0.138[1]	-2.149	-2.062	-2.495

The Granger Causality test is used to test the causality relationship between the variables. The empirical result in the chapter is analysed by using a multivariate Granger Causality test in order to examine the relationship between the variables in this study. The following table will show the results of the test. The granger causality tests between economic growth, FDI, export and also import have been conducted to examine causality between these variables. There is a one-way causality which runs from economic growth to FDI. It means that the increase in economic growth each year will affect the increase in the level of FDI, but the result does not support the Granger causality between economic growth and exports in ASEAN. On the other hand, for export and import, we found that export has a significant influence on import; also import has an effect on export. This mutual influence can explain that when ASEAN increases the imports of advanced technology and equipment, it drives export of light manufacturing or more sophisticated electronics and industrial supplies, and vice versa.

Table 3: Granger causality test

Excluded	F-Stat	Prob.
FDI does not Granger cause RGDP	1.651	0.2717
RGDP does not Granger cause FDI	1.219	0.2311
EXP does not Granger cause RGDP	1.721	0.2360
RGDP does not Granger cause EXP	1.182	0.2870
IMP does not Granger cause RGDP	1.613	0.6510
RGDP does not Granger cause IMP	1.222	0.1219

Export affects the rate of economic growth and also can be saying that, economic growth does not affect export. On the other hand, the null hypothesis for import does not Granger cause export and export does not Granger import can be rejected, so it can be concluded that two variables have a relationship of mutual influence (two-way relationship) because of intra-trade and imports of intermediate goods, technology and export of industrial products.

Table 4: ECM results

Dependent Variable:	Model 2
$RGDP_{t-1}$	
FDI_{t-1}	-0.0198** (0.022)
EXP_{t-1}	0.0254** (0.004)
IMP_{t-1}	0.0622** (0.076)
ECT_{t-1}	0.0488** (0.094)

This result is in accordance with our expectation that economic growth will provide a positive influence on the level of FDI. According to theory and empirical studies, among the main determinant is the market size of the host country, which would have an effect on the economic prospective.

FDI flows can be induced by the host country economic growth if the host country offers a sizable consumer market. So overall, we can conclude that economic growth and FDI only has a one-way relationship.

Conclusion

The dynamic influence of unitary shocks on different variables is shown by use of the Vector Autoregressive Castro and Nevárez (2018) Model. The influence of random shocks or disturbances is analysed with the VAR model. In this study, because the export and import variables are stationary at second difference, before the analysis model, we need to transform the variables to second difference, and FDI transform to first difference, and it is stationary at I (1) process. The relationship between FDI, import and export, and economic growth of ASEAN has been analysed in this research for the years 1980-2017. This research has worked on empirical and theoretical investigation to draw conclusions. The study specifies the econometrics model and growth model along with discussing the positive influence of FDI and exports on the economy of ASEAN. Moreover, the research has used time series data for the specified number of years. The Granger causality tests between economic growth, FDI, export and also import have been conducted to examine causality between these variables. There is a one-way causality which runs from economic growth to FDI. It means that the increase in economic growth each year will affect the increase in the level of FDI, but the result does not support the Granger causality between economic growth and exports in ASEAN. On the other hand, for export and import, we found that export has a significant influence on import; also import has an effect on export. This mutual influence can explain that when ASEAN increases the imports of advanced technology and equipment drives export of light manufacturing or



more sophisticated electronics and industrial supplies, and vice versa. This study is to investigate the importance of exports, imports and FDI on economic growth in one framework.

REFERENCES



- Agiomirgianakis, G. (2017). Foreign Direct Investment and European Integration. *European Integration*, 346.
- Arif, I., Khan, L., & Ali Raza, S. (2018). External Resources and Economic Growth: An Empirical Analysis of South Asian Countries. *Zagreb International Review of Economics & Business*, 21(2), 1-17.
- Asgar, A. (2016). Foreign Direct Investment and Trade Openness: The Case of South Asian Economies. *International Journal of Innovation and Applied Studies*, 17(2), 513.
- Audretsch, D. B., & Lehmann, E. (2016). *The seven secrets of Germany: Economic resilience in an era of global turbulence*: Oxford University Press.
- Basheer, Siam, M., Awn, A., & Hassan, S. (2019). Exploring the role of TQM and supply chain practices for firm supply performance in the presence of information technology capabilities and supply chain technology adoption: A case of textile firms in Pakistan. *Uncertain Supply Chain Management*, 7(2), 275-288.
- Boutayeba, F., & Ramli, M. (2019). The Link Between Education And Economic Growth In Algeria: An Empirical Investigation. *International Journal of Advanced Research in Education and Society*, 1(1), 35-43.
- Castro, M. C., & Nevárez, J. B. (2018). Exogenous or Endogenous Economic Growth: A Mexican States Convergence Research.
- Chiu, S. W.-k. (2018). *City states in the global economy: Industrial restructuring in Hong Kong and Singapore*: Routledge.
- Chu, A. C., Furukawa, Y., & Ji, L. (2016). Patents, R&D subsidies, and endogenous market structure in a Schumpeterian economy. *Southern Economic Journal*, 82(3), 809-825.
- Dass, A. (2018). *Nexus of imports in influencing exports, domestic demand and services amongst ASEAN-5 countries*. Universiti Utara Malaysia.
- Daugbjerg, C. (2017). Responding to Non-Linear Internationalisation of Public Policy: The World Trade Organization and Reform of the CAP 1992–2013. *JCMS: Journal of Common Market Studies*, 55(3), 486-501.
- de Pineres, S. A. G., & Ferrantino, M. J. (2018). *Export dynamics and economic growth in Latin America: a comparative perspective*: Routledge.
- Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica: journal of the Econometric Society*, 1057-1072.

- Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 251-276.
- Gunby, P., Jin, Y., & Reed, W. R. (2017). Did FDI really cause ASEAN economic growth? A meta-analysis. *World Development*, 90, 242-255.
- Hong, C.-Y., Yen, Y.-S., & Chien, P.-C. (2019). Sources of Economic Growth and Changes in Energy Consumption: Empirical Evidence for Taiwan (2004-2016). *International Journal of Energy Economics and Policy*, 9(3), 346-352.
- Iamsiraroj, S. (2016). The foreign direct investment–economic growth nexus. *International Review of Economics & Finance*, 42, 116-133.
- Ighodaro, C. A., & Ogbomo, F. (2018). The Dynamics of Exports and Economic Growth: Assessing the Evidence from Nigeria. *American Economic & Social Review*, 4(1), 15-22.
- Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of economic dynamics and control*, 12(2-3), 231-254.
- Konstantakopoulou, I. (2016). New evidence on the Export-led-growth hypothesis in the Southern Euro-zone countries (1960-2014). *Economics Bulletin*, 36(1), 429-439.
- Kumar, V. (2018). Exports, Imports, and Economic Growth in India: Evidence from Causality, Cointegration and Toda–Yamamoto Wald Test. *Cointegration and Toda–Yamamoto Wald Test (September 15, 2018)*.
- Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3-42.
- Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The quarterly journal of economics*, 107(2), 407-437.
- Murinde, V. (2017). Export promotion and economic growth: evidence on African economies *The Free Trade Area of the Common Market for Eastern and Southern Africa* (pp. 131-154): Routledge.
- Musila, J. W., & Yiheyis, Z. (2015). The impact of trade openness on growth: The case of Kenya. *Journal of Policy Modeling*, 37(2), 342-354.
- Neeliah, H., & Seetanah, B. (2016). Does human capital contribute to economic growth in Mauritius? *European Journal of Training and Development*, 40(4), 248-261.



- Osho, G. S., & Adishi, O. (2019). The Effects of Macroeconomic Variables on Lagos State Economy: As Lagos Economy Goes, So Goes the Economy of Nigeria? *Journal of Economics*, 7(1), 1-9.
- Paleologou, S.-M. (2016). The long-run tendency of government expenditure: a semi-parametric modelling approach. *Empirical Economics*, 50(3), 753-776.
- Qamruzzaman, M. (2015). Determinants of Foreign Direct Investment (FDI): Evidence from Bangladesh. *Pacific Business Review International*, 7, 97-105.
- Raeni, A. A. G., Hosseini, S., & Moghaddasi, R. (2019). How energy consumption is related to agricultural growth and export: An econometric analysis on Iranian data. *Energy Reports*, 5, 50-53.
- SAĞLAM, Y., & EGELİ, H. A. (2017). EMPIRICAL ANALYSIS OF EXPORT-LED GROWTH AND DOMESTIC DEMAND-LED GROWTH HYPOTHESES IN EAST ASIA. *Uluslararası İktisadi ve İdari İncelemeler Dergisi*(19), 211-226.
- Samimi, A. J., Sadeghi, S., & Sadeghi, S. (2017). The relationship between foreign direct investment and tourism development: evidence from developing countries. *Institutions and Economics*, 59-68.
- Shiller, R. J. (2017). Narrative economics. *American Economic Review*, 107(4), 967-1004.
- Siddiqui, A., & Rehman, A. u. (2017). The human capital and economic growth nexus: in East and South Asia. *Applied Economics*, 49(28), 2697-2710.
- Sothan, S. (2016). Foreign direct investment, exports, and long-run economic growth in Asia: panel cointegration and causality analysis. *International Journal of Economics and Finance*, 8(1), 26-37.
- Sunde, T. (2017). Foreign direct investment, exports and economic growth: ADRL and causality analysis for South Africa. *Research in International Business and Finance*, 41, 434-444.
- Sundrum, R. (1990). *Economic growth in theory and practice*: Springer.
- Tumwebaze, H. K., & Ijjo, A. T. (2015). Regional economic integration and economic growth in the COMESA region, 1980–2010. *African Development Review*, 27(1), 67-77.
- Vo, X. V. (2018). Determinants of capital flows to emerging economies-Evidence from Vietnam. *Finance Research Letters*, 27, 23-27.



Wahyudi, S. T., & Jantan, M. D. (2012). The determinants of economic growth in ASEAN-4 countries: an application of Solow-Swan and Mankiew-Romer-Weil Models. *ASEAN-USA Business Review*, 11(4).

Yüksel, S., & Zengin, S. (2016). Causality relationship between import, export and growth rate in developing countries.