Trade Openness, Government Development Expenditures, Gross Capital Formation and Economic Growth: An ASEAN Case

Jopinus Saragih[a]*, Jumadiah Wardati[b], Ikbar Pratama[c]**, [a,b]Faculty of Economics, Universitas Efarina, Simalungun, Sumatera Utara, Indonesia, [c]School of Accountancy, College of Business, Universiti Utara Malaysia, Sintok, Malaysia, Email: [a]*jopinuss@gmail.com, [c]**ikbar.p@gmail.com

The present study aims to provide a comprehensive understanding regarding the significance and impact of economic growth variables in Thailand. Therefore, the present study will enable signifying the areas which require efforts towards achieving economic growth development in Thailand. Furthermore, this research will offer recommendations for managing variables and establishing policies, which serve as catalysts for the economic development of Thailand's economy. Therefore, accurate and goods actions are needed, since it is the basic pulse to achieve the development of nations. A strong economy depicts the real development situation and protects the higher prosperity of people, which develops peace and stability in the economy. Such empirical findings may provide insights to other researchers, including to investigate it and offer a better explanation. However, this study focusses upon the economic growth determination in Thailand using 40 years of data, during the period of 1976–2018.

Keywords: *Economic growth, Openness, Gross capital formation, Thailand.*

Background

Sustainable economic growth (ECNG) is desirable for every country in the world. Thailand has been striving to become a developed and high-income economy. Sustainable ECNG acts in a critical role since it offers a good standard of living for the community (Feldman, Lanahan, & Kemeny, 2016). The ECNG of Thailand is estimated by a rate of change (percentage) in the Gross Domestic Product (GDP). Thailand is an open economy which practices an export-oriented system. When the GDP of a country increases from the previous

year, it signifies the ECNG. However, a percentage change in the country's real GDP explains the growth rate of the economy.

ECNG acts as a significant performance measure to assess the growth and development of the economy (Huang, Yang, & Cheng, 2017). Further, it explains the physical development of the economy in terms of an additional increase in infrastructure and improved living standards through an increase in real income over time (Nugraha & Osman, 2018). The GDP is defined as the sum of the market value for all the services and goods produced during a year and within the boundaries of a country (Moreau & Vuille, 2018). According to studies, GDP is the aggregate value for all the final goods and services that are produced by using those factors of production that are owned by a country's foreign and local nationals (Hakimah et al., 2019). Moreover, the main purpose of ECNG is to raise the standard of living of an overall economy by government efforts to eradicate underdevelopment and factors which are causing it, to narrow down the rich and poor gap in the society, and to promote balanced development. Zulkhibri, Naiya, and Ghazal (2015) also stated that the ECNG rate refers to the yearly increase in the economy's total national income. However, Güven and Ayvaz (2018) defined ECNG as the growth in the country's economic activity, leading to the production of goods and services for the public to improve the community's welfare as a whole. ECNG is related to the productive growth of potential output when there is full employment. In addition, ECNG refers to the fundamental improvement in technology, the literacy rate, and capital stock (Adnans & Muda, 2018).

The driving forces behind ECNG involve increases in productivity, i.e. more goods and services production with capital, energy and manpower as the inputs. ECNG plays a vital role in a country as it helps in the development process and the progress of a country is represented by its ECNG (Nugraha & Osman, 2018). Thus, implementing appropriate government policies significantly contributes towards the achievement of the country and its government's objectives to ensure a sustained level of growth in Thailand by 2020, and to become a developed nation.

Therefore, any issues in ECNG related factors explains the effective generation of ECNG in the future. As such, radical changes must be considered to achieve long-term sustainable growth for every Thai citizen and for achieving the status of a high-income economy. Thus, those macroeconomic variables which affect Thailand's growth rate must be studied. The present study will examine four growth indicators, namely, foreign direct investment (FDI), trade openness, gross fixed capital formation, and government development expenditure, as well as the impact of these factors on Thailand's GDP growth (Polyxeni & Theodore, 2019). Thus, the question arises whether the data set of these chosen variables are related to Thailand and the economy? If significant, then whether these variables can explain

Thailand's ECNG, and how this obtained information may help to develop ECNG promoting policy?

The present study aims to provide a comprehensive understanding regarding the significance and impact of ECNG variables in Thailand. Therefore, the present study will enable signifying the areas which require efforts towards achieving ECNG development in Thailand. Furthermore, this research will offer recommendations for managing the variables and establishing policies, which serve as catalysts for the economic development of Thailand's economy. Therefore, accurate and goods actions are needed, since it is the basic pulse to achieve the development of nations. A strong economy depicts the real development situation and protects the higher prosperity of people, which develops peace and stability in the economy. Such empirical findings may provide insights to other researchers, including to investigate it and offer a better explanation. However, this study focusses upon the ECNG determination in Thailand, using 40 years of data during the period of 1976–2018. The current research employed yearly data of OPEN, GDE, FDI, GFCF, and GDP from different sources, including the World Bank, Bank Negara Thailand, Department of Statistics, Economic Planning Unit website and the official website of Thailand. This study is also limited, in that there was a lack of time for conducting the study.

Literature Review

Trade Openness

Several economists and researchers who are concerned regarding trade openness, would largely focus on how the national economy influences through trade openness. These economists have particularly emphasised upon discussing the theoretical relationship among ECNG and trade openness. According to Tanna, Topaiboul, and Li (2018), ECNG enhances with openness through various channels, including trade increases the variety of capital equipment and intermediate goods, which then expands the productivity of a country and its resources. In developing economies, trade allows access to the technological improvement by developed economies, such as, incorporating capital goods, and trade intensifies the capacity utilisation, thereby increasing the consumption level and product variety. For the domestic producers, the trade openness creates a larger market and allows it to function even at the minimum scale and enjoy the benefits of increasing returns to scale.

A study by Tanna et al. (2018) attempted to analyse the causal association among ECNG and openness in Middle East and North Africa (MENA) countries by using the Granger error correction method on the annual data of each economy. The findings of this study were categorised as follows. The granger causality test shows that in Syria, Jordan and Egypt, one-way causality is found running from openness to ECNG. In Morocco, Iran and Tunisia, a

one-way causal relation is found from ECNG to openness. Secondly, the results from the granger causality test that are based on the vector error correction method reveal the existence of a unidirectional causality running from ECNG to openness in Turkey, in both the short and long term, as well as only in the long term in the case of Israel. The results also indicate that there is a two-way causality only in the long term in Algeria.

By using data from Bangladesh for the period 1975 to 2010, Yenipazarli (2017) used the cointegration test and Granger causality test. They found the existence of a short and long term relationship between trade liberalisation and ECNG, and a unidirectional causality test run from ECNG to trade liberalisation. They divided data into two periods before and after the implementation of the South Asian Association for Regional Cooperation (SAARC), over 1972 to 1985, and 1986 to 2007. Their main findings were categorised into three elements. Firstly, short run unidirectional causality from GDP to openness in 1972 to 1985. Meanwhile, in 1986 to 2007, there existed a bidirectional causality GDP and openness. Secondly, in 1972 to 1985, there existed a long term negative relationship, and in 1986 to 2007, existed a long term positive relationship. Lastly, in this finding we can conclude that after the implementation of the SAARC, economic outcomes were better than before the implementation of the SAARC. The classical and neoclassical economic theory argues that international trade (openness) leads to ECNG. There are number of reasons why being open to international trade leads to ECNG. Openness to international trade stimulates gains from specialisation and trade, innovation and efficient production, and the adoption of sound policies to ensure the country is attractive to foreign investors.

According to Ricardian theory, when there is trade openness, the country tends to specialise in those goods which have a comparative advantage in labour-productivity and start exporting this product, to stimulate the process of ECNG. However, according to Hecksher-Ohlin (H-O) theory, a country only exports those goods which intensively utilises its economy's abundant factor. When the economy opens for trade, the resources then tend to shift to those sectors which use the abundant factor, resulting in the increase in the total value of production. The new growth theory provides major insights regarding the growth and trade relationship. For instance, when research and development (R&D) activities drive growth, then trade offers technological access to its trading partners. In addition, trade also encourages research and development (R&D) advancements and provides access to bigger markets. In particular, trade offers access to intermediate goods and investment to the developing economies which are critical for the development processes of the countries. Finally, if introducing a new product range is the engine to ECNG, then trade significantly contributes by allowing access to the new inputs and variety of products.

Foreign Direct Investment

There is rich existing literature emphasising the foreign direct investment's (FDI) positive impact on ECNG. It is assumed that FDI increases productivity, employment opportunities, technological innovations and exports (Öğrül & Eryiğit, 2015). Meanwhile, the new growth theory particularly focusses on how ECNG greatly influences through technological changes. According to this theory, one such source of technological improvement is FDI. Larger FDI inflows positively contribute to the new technology utilisation, which in turn improves the labour and capital's productivity in the host country. Subsequently, the ECNG of the host country will increase. Growth theory also highlights economic integration and globalisation around the world. FDI and exports significantly contribute to the development of the entire world, since a triangular relationship exists between all three items: ECNG, exports, and FDI (Chan & Tang, 2017). According to neoclassical theories, FDI acts as an ECNG driver.

Abubakar and Bala (2016) investigated the causal relationship between ECNG and FDI in Pakistan. For this purpose, the Granger causality test and cointegration techniques were employed and the findings suggest that no causality runs from FDI to GDP. It also indicates that in case of Pakistan, ECNG is at low levels to attract foreign investors. The major reasons are the dependency on aids and loans from the IMF, World Bank, and other financial institutions, as well as the economic instability. According to Jordaan (2016), FDI can also increase job opportunities in which multinational companies will train employees and managers better. In his study, he also found that FDI will promote exports through the construction of factories and help the company in the receiving country into the international market through exports activities. Öğrül and Eryiğit (2015) studied FDI on ECNG in the Guinea Republic in west Africa and used the Granger causality test for the period of 1985 to 2008. For this country, they found a unidirectional causality run from GDP to FDI. Furthermore, Rehman (2016) attempted to analyse in their study whether the ECNG of 69 developing economies were influenced by the effects of FDI. The study reported that an increase in FDI positively influences these developing countries' ECNG. FDI is a powerful instrument for transferring technology from the high-income countries to the developing economies and also contributes in their ECNG, to some extent.

Sengupta and Puri (2018) attempted to identify the linkage between FDI and ECNG in Nepal by employing samples from 1980 to 2006. They used the cointegration and Granger causality tests. The estimated results of the study provide evidence that there is a long term equilibrium relationship among these variables and the Granger causality test suggested that FDI granges the gross domestic product in Nepal. Adalı and Yüksel (2017) examined the relationship and the direction of causality between FDI and ECNG in Turkey by using the Bound test for cointegration and Granger causality tests. The results indicated that there is a long term

relationship and granger cause run from ECNG to FDI. He suggested that the economic development in turkey stimulates the net FDI inflow.

Gupta and Singh's (2017) study explored direct investment through an industrial organisation perspective. They distinguished between portfolio investments and foreign investment. According to the study, investment portfolio is investment where there is no control over the entity carried out. Meanwhile, direct investment refers that there is direct control over investment activities. It was stated that there are two reasons to invest in direct investment, which are to ensure the safety of the investments made, and investors are able to penetrate foreign markets.

For Dunning, it is not only an important organisational structure, otherwise investors will engage in FDI if it also fulfils all three circumstances of locational advantages (i.e. low wages, tariffs or special taxes, existing raw materials), internalisation advantages (those advantages gained through partnership, i.e. joint venture or licensing) and ownership advantages (production technique, returns to scale, trademark, entrepreneurial skills). Dunning also stated that market imperfections have been a reason for investors to carry out investments to penetrate the market potential, ensure that production resources are sufficient for the production of goods and services, and to develop a comparative advantage.

Government Development Expenditure

Around the globe, as the economy grows, the public expenditures will also continue to expand. In the view of Wagner, an increase in the national income would result in a higher GovS, which implies that the size of national income growth determines the volume of GovS. This increase in GovS can be in social, security, cultural and administration areas. Wagner also stated that GovS must be increased because of three reasons: 1) for a country's social activities; 2) for protection and administrative actions; and 3) for welfare purposes. Wagner's law also specifies that the growth of public expenditure is higher when compared to ECNG. By analysing the empirical findings of previous research conducted on developed economies, it is found that government activities have a higher growth rate compared to ECNG rate. This finding also suggests that the elasticity will be equal to one for GovS on national revenue. This can be interpreted that a one per cent increase in national revenue will bring more than a one per cent increase in public spending.

Usman and Agbede (2015) also listed five different basic interpretations of Wagner's law. In the first basic, Odhiambo (2015) stated that GovS should grow at a faster rate than the output of the country. This is a prerequisite to get public expenditure elasticity greater than one and further, Wagner's law can be trusted. Odhiambo (2015) uses GNP data as an indicator of ECNG. In the second basic, Zakaria, Sarmidi, and Othman (2017), Gretschmann (2015), and

Howe (2016), replaced GNP with the national income as a measurement of ECNG. They present the same conclusion that the elasticity of government expenditure to national income must be greater than one to confirm Wagner's law. In the third, Abu-Eideh (2015) uses GDP per capita as a measurement of ECNG. He concluded that the elasticity of GovS to GDP per capita must be greater than one to confirm Wagner's law.

Furthermore, they observed unidirectional causality run from GDP to development expenditures. The finding supports Wagnerian theory, that an increase in national income causes more development expenditure. This means that, when the growth of the economy grew one per cent, public spending will rise by more than one per cent. They utilised data from Iran and used the bounds test approach to cointegration developed by Ozturk and Acaravci (2016), and Toda's and Yamamoto's test for Granger causality in this country. They found that there was a unidirectional causality running from ECNG to the size of the government. The findings show the validity of Wagner's law in the Iranian economy during the period from 1960 to 2008.

Fourth, Ali and Munir (2016) stated that GovS per capita is more accurate in measuring the growth of GovS. He concluded that the elasticity of per capita expenditure should be greater than one so that the Wagner law is true and confirmed. Fifth, Muhammad and Karim (2015), and Gatsi, Appiah, and Gyan (2019) use the expense ratio as a measure of GovS growth. They concluded that the elasticity of the expense ratio should be greater than one if wanting to confirm Wagner's law. Meanwhile, the macro economic theory of J.M. Keynes assumes that government expenditure will boost the national income. This means that public expenditure causes the national income. In addition, Keynes also proved that the multiplier of GovS is greater than the value of the tax multiplier. In effect, the output will increase more significantly with the increase in GovS policy than the tax reduction policy.

In the Peacock-Wiseman hypothesis, Peacock-Wiseman studied the impact on public spending in the United Kingdom (UK) in 1891 and until 1955, under the laws of Wagner. In this study, he said that Wagner's law still applied. Further, he agreed that an increase in national income will boost public expenditure. Secondly, when there is an increase in revenue collection, the government cannot ignore the peoples' demands on various services. Thirdly, the government is to increase taxes at war time to obtain more funds for the needs of defence spending.

Gross Fixed Capital Formation

Gross fixed capital formation (GFCF), an expenditure on the GDP component, shows how much of the economy's new value added is invested and not consumed. GFCF is defined as the net increase in physical assets, i.e. investments after excluding disposal. GFCF does not

involve fixed capital usage (depreciation), and purchase of land. In fact, it is a GDP calculating component of national income's expenditure approach.

Murindahabi, Li, and Ekanayake (2019) stated that the capital formation has an importance on ECNG. Their statement is that capital formation is very significant for the rate of GDP and the sustainability of a country. Another study also examined the ECNG and capital formation relationship in India, by employing data for the time period from 1951–2009. The findings obtained for this research show that a one-way causality exists which runs from capital formation to ECNG in the long term. Scholar examined ECNG and capital formation for the period from 1951–2010 and found empirical evidence that growth occurs as a result of efficiency and capital formation. Rafindadi and Almustapha (2017) attempted to assess the productivity of private and public capital formation in the Thailand economy, using data for 1961–1995. They found that during the period of study, public investment remained unproductive, although a significant relationship was found between ECNG and private investment. Borja (2017) studied the case of the Nigerian economy and assessed the capital formation, ECNG and foreign private investment relationship using the two-stage least square (2SLS) method. They found that foreign capital investment negatively influences capital formation in Nigeria. In addition, the study revealed that capital formation and foreign private investment significantly contributed to Nigeria's ECNG.

Belloumi and Alshehry (2018) investigated the causality among ECNG and fixed capital formation for the case of seven countries during 1960–1995. The study reported a bi-directional causality in the UK and Japan among fixed investment share in GDP and ECNG, one-way causality from ECNG towards fixed investment share in GDP for Germany, Canada, and Italy, and one-way causality from fixed investment share in GDP towards ECNG for the United States and France. In regard to transition economics, Lim and Lean (2016) carried out a study to examine the causal relationship between GFCF and ECNG in four countries during 1993 to 2005. The empirical results demonstrate that Hungry and Latvia's GFCF granger cause GDP. Meanwhile, Bulgaria and Estonia GDP granger cause GFCF. In different studies on the capital formation in Bangladesh over the period of 1986 to 2008, the findings suggested that capital formation had a positive effect on GDP. Owolabi-Merus (2015) applied the Harrod-Domar model to examine the relationship between capital formation and ECNG over the period of 1979 to 2009. The empirical findings are consistent with the Harrod-Domar model, indicating that the national income growth rate is positively associated with the capital formation in Nigeria.

The Harrod Domar model states that investment will lead to a higher growth. Each country should use part of the current consumption to invest in capital formation. The increase in capital formation will result in increased investment and this leads to an increase in ECNG. Capital formation is very important because it will be able to bring new technology, new

techniques and knowledge. Hulten and Ramey (2017), and Nyoni and Mutongi (2019) noted that capital formation leads to technological progress, innovations, and changes in productivity over time. New growth theories point out the importance of physical capital in the long term of ECNG.

Estimation

To assess the ECNG and explanatory variables relationship, a unit root test must be employed before applying any econometric estimation techniques. Therefore, a Vector Autoregressive Castro and Nevárez (2018) approach and Johansen and Juselius cointegration test is used. The study also aims to test the causality among the set of explanatory variables and ECNG to determine the direction of causality. Furthermore, the Johansen and Juselius approach for assessing the relationship is employed. Whereas, for assessing the short term relationship, the Vector Error Correction Model (VECM) is applied. Finally, an auto-regressive conditional heteroskedasticity, lagrange multiplier, and normality tests are applied for diagnostics and for checking model robustness. Below is the detailed procedure of these tests.

In econometric theory, for obtaining the realistic regressions, the variables involved in the model must be stationary. Therefore, a stationarity test must be performed to check whether self-correcting or relatively permanent economic factors influence these variables. More specifically, a unit root test is applied, and for checking the data stationarity, an augmented Dicky-Fuller test is used, which helps in assessing more complicated and larger time-series models.

The statistics used in the augmented Dickey-Fuller test is negative, and the greater the negative value, the greater the possibility of rejecting the null-hypothesis that there is unit root. For testing it, the following equation is considered:

$$\Delta y_t = \beta_1 + \beta_{2t} + \delta y_{t-1} + \alpha_i \sum \Delta y_{t-1} + \varepsilon_t \tag{}$$

Here, y_t represents the variable of interest, t shows the time trend, Δ represents differencing operators, ε shows white noise error term with mean=0 and constant variance. Whereas, β_1, β_2, α_i, and δ are the parameters to the model which needs to be estimated. Thus, the following are the null and alternative hypotheses for applying unit root tests:

H0: $\delta = 0$ (with non-stationary y_t)
H1: $\delta \neq 0$ (stationary y_t)

If the t-statistic obtained from the test is less than the tabulated critical value, then Ho will be rejected. Putting differently, unit-root exists in y_t series when δ= zero (Gujarati, 1995), and we will not reject the null hypothesis.

Given the non-stationary properties of time series data, the long term association among different time series must be considered to assess the existence of any cointegrating relation between the model variables. However, a series is integrated of order d when a stationary series is obtained by differencing it for d times. After checking for stationarity, the approaches by Johansen (1988), and Johansen and Juselius (1990) are used to determine whether any relationship exists between the variables in the long run, i.e. performing co-integrating vectors test.

$$Yt = \prod_1 Y_{t-1} + \prod_2 Y_{t-2} + \ldots + \prod_k Y_{t-k} + \varepsilon_t, \, t = 1, 2, \ldots, n \, (2)$$

Here, Y_t is the N×1 stochastic variable's vector, $\prod_1, \prod_2, \ldots, \prod_k$ represents n×n parameter, εt represents error term. In case of non-stationary Yt, we can rewrite the above equation as:

$$\Delta Yt = \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + \ldots + \Gamma_{k-1} \Delta Y_{t-k+1} + \prod Y_{t-k} + et$$
Where $\Gamma_i = -[I - \prod_1 - \prod_2 - \ldots - \prod_i]$
$i = 1, 2, \ldots, k-1$ and $\prod = -[I - \prod_1 - \prod_2 - \ldots - \prod_k]$

Here the matrix $\prod$ explains the relationship among p variables in the long term, which can further be broken down into A & B, i.e. AB'. Here A indicates VECM parameter, and B indicates cointegrating vector. The current procedure is performed with a purpose of assessing the long term association between GDP, FDI, OPEN, GFCF, and GDE, in equation three. The explanatory variables' long run impact on GDP will also be examined through this approach.

$$GDP_t = \alpha_0 + Open_t + FDI_t + GDE_t + GFCF_t + u_t \, (3)$$
GDP = Gross domestic product
OPEN = Trade openness
FDI = Foreign direct investment
GDE = Government development expenditure
GFCF = Gross fixed capital formation
α = the parameter for the explanatory variables
t = time series
μ = error term

Results

Prior to the econometrics analysis, the statistical correlation of the variables is examined, which helped in determining the statistical relationships between and amongst the variables.

Table 1: Correlation Analysis

		1	**2**	**3**	**4**	**5**
Open	**1**	1				
FDI	**2**	0.830**	1			
GDE	**3**	0.257**	0.243**	1		
GFCF	**4**	0.810*	0.118**	0.829*	1	
RGDP	**5**	0.145**	0.463*	0.129	0.579*	1

Therefore, at first difference, the unit root test is performed for the variables to assess whether the data is stationary and found that all variables exhibit stationarity at first difference. Therefore, we do not accept the null hypothesis

Table 2: Unit Root test

Variable	First Difference	
	Constant	Constant and Trend
Open	-1.923419191[0] (0.2364)	-0.631812131[0] (0.6211)
FDI	-1.531812131[0] (0.3451)	-0.723234112[0] (0.2271)
GDE	-1.739281211[0] (0.4721)	-0.8237162111[0] (0.7212)
GFCF	-1.723818011[0] (0.5237)	-2.0352515115[0] (0.9721)
RGDP	-1.823419191[0] (0.4236)	-2.923419191[0] (0.7821)

The Granger causality test is used to test the causality relationship between the variables. The empirical result in Table 3 is analysed by using a multivariate Granger causality test in order to examine the relation between the variables in this study. The following table shows the result of the test.

Table 3: Granger causality test

Excluded	F-Stat	Prob.
Open does not granger cause GDP	1.651	0.3717
GDP does not granger cause Open	2.219	0.4211
FDI does not granger cause GDP	3.721	0.2260
GDP does not granger cause FDI	1.182	0.7360
GDE does not granger cause GDP	1.613	0.0110*
GDP does not granger cause GDE	1.222	0.1219
GFCF does not granger cause GDP	1.236	0. 2361
GDP does not granger cause GFCF	**2.071**	**0.2871**

The co-integration test is carried out using the Johansen procedure. The cointegration test explains the existence of a long-run association between two or more variables. While performing the cointegration analysis, all variables are assumed to be non-stationary and all variables are integrated of the same order. In the case of an integration of a different order, cointegration analysis can still be applied. This situation is referred to as multi-cointegration. Afterwards, an Akaike Information Criterion (AIC) is used for choosing the optimum lag length to perform the Johansen-Juselius cointegration analysis. According to Shrestha and Chowdhury (2005), the AIC is generally used to choose the relevant lag length. If one or more co-integrated vector is obtained in the model, then it indicates the existence of a long-run association between the variables. In addition, a cointegration test is also performed by taking GDP as the dependent variable.

Table 4: Lag Length Selection Criterion

Lag	LogL	LR	FPE	AIC	SC
0	-730.929	NA	4.05e+12	46.058	46.332
1	-624.659	166.047*	5.24e+10*	41.667	43.590*
2	-585.566	46.418	5.58e+10	41.473*	45.046

Table 5 shows the cointegration test results for linear deterministic trend, based on the Max-Eigen statistic and Trace statistic with restriction.

Table 5: The result of cointegration test

Variable	Coefficient	t-statistics
$Open_{t-1}$	1.372334	5.5625151***
FDI_{t-1}	0.423077	2.9010100*
GDE_{t-1}	2.251431	3.2919199**
$GFCF_{t-1}$	0.982616	4.2717171***

Note: ***,** , * indicates significant at 1% , 5% and 10% significance level

Table 5 shows the results obtained after performing the co-integration approach by Johansen and Juselius. On the other hand, employing a vector error correction model (VECM) will provide a comprehensive understanding about the non-stationary nature of association between various components and may improve the forecasting of an unconstrained model in the long run.

Under the Vector Autoregressive Model Castro and Nevárez (2018) approach, a multivariate co-integration test by Johansen and Juselius (1990) is employed to check the variables that are involved in this model, followed by the application of a Granger causality test for analysing the causality between ECNG and explanatory variables.

Table 6: ECM results

Dependent Variable	Model 3
$RGDP_{t-1}$	0.0488**
	(0.094)
FDI_{t-1}	0.1198**
	(0.002)
GDE_{t-1}	0.1254***
	(0.000)
$GFCF_{t-1}$	0.0522**
	(0.006)

Note: ***,** , * indicates significant at 1% , 5% and 10% significance level

Conclusion

For the country's economic development, ECNG is used as a measure of performance. Therefore, a country can achieve ECNG by measuring growth in the national income. Thus, it is necessary to develop a balanced and healthy ECNG for determining a country's economic development and more advanced standard of living for the people. This study attempts to

examine GDP determinants for the years 1980–2017. Thus, this study aims to examine the impact of foreign direct investment, openness, gross fixed capital formation, and government development expenditure on Thailand's ECNG behaviour. The study chose these variables by analysing the theoretical framework that is formulated in previous research studies and on the basis of the new growth theory.

The present study aims to provide a comprehensive understanding regarding the significance and impact of ECNG variables in Thailand. Therefore, the present study will enable signifying the areas which require efforts towards achieving ECNG development in Thailand. Furthermore, this research will offer recommendations for managing variables and establishing policies, which serve as catalysts for the economic development of Thailand's economy. Therefore, accurate and goods actions are needed, since it is the basic pulse to achieve the development of nations. A strong economy depicts the real development situation and the protected and higher prosperity of the people, which develops peace and stability in the economy. Such empirical findings may provide insights to other researchers, including to investigate it and offer a better explanation. However, this study focusses upon the ECNG determination in Thailand using 40 years, during the period from 1976–2018. The current research employed yearly data of OPEN, GDE, FDI, GFCF, and GDP from different sources, including the World Bank, Bank Negara Thailand, Department of Statistics, Economic Planning Unit website and the official website of Thailand. This study also has a limitation, in that there was a lack of time for conducting the study.

In order to examine the relationship between the variables in the long-run, the Johansen and Juselius cointegration test is used. Whereas, the VECM approach was employed for analysing the short-run speed of adjustment. Therefore, these variables are the crucial components for successfully achieving the country's economic objectives. Besides, statistically significant results are obtained for foreign direct investment and openness in the short-run, which is carried out through the VECM model. Whereas, insignificant results are obtained for gross fixed capital formation and government development expenditure. Furthermore, the short-run speed of adjustment is moderated based on the ECM variable, indicating that for ECNG, a 34.4 per cent of adjustment took place in a year.

REFERENCES

Abu-Eideh, O. M. (2015). Causality between public expenditure and GDP growth in Palestine: An econometric analysis of Wagner's law. *Journal of Economics and Sustainable Development, 6*(2), 189-199.

Abubakar, A. B., & Bala, A. J. (2016). Nexus Between Domestic Investment, FDI and Economic Growth: Empirical Evidence from India. *International Journal of Management, Accounting and Economics, 3*(3), 174-184.

Adalı, Z., & Yüksel, S. (2017). Causality relationship between foreign direct investments and economic improvement for developing economies. *Marmara İktisat Dergisi, 12*, 109-118.

Adnans, A. A., & Muda, I. (2018). Neoclassical Growth Model Application To The Analysis Of Human Capital For Regional Development. *Eurasian Journal of Economics and Finance, 6*(4), 1-13.

Ali, W., & Munir, K. (2016). Testing Wagner versus Keynesian Hypothesis for Pakistan: The Role of Aggregate and Disaggregate Expenditure.

Belloumi, M., & Alshehry, A. (2018). The impacts of domestic and foreign direct investments on economic growth in Saudi Arabia. *Economies, 6*(1), 18.

Borja, K. (2017). Corruption indicators, foreign capital, and economic growth in developing countries. *The Journal of Developing Areas, 51*(4), 95-107.

Castro, M. C., & Nevárez, J. B. (2018). Exogenous or Endogenous Economic Growth: A Mexican States Convergence Research.

Chan, S. M., & Tang, T. C. (2017). Foreign direct investment inflows and intellectual property rights: Empirical evidence from different income groups. *Global Economic Review, 46*(4), 372-401.

Feldman, M., Lanahan, L., & Kemeny, T. (2016). The logic of economic development: a definition and model for investment. *Environment and Planning C: Government and Policy, 34*(1), 5-21.

Gatsi, J. G., Appiah, M. O., & Gyan, J. A. (2019). A test of Wagner's hypothesis for the Ghanaian economy. *Cogent Business & Management, 6*(1), 1647773.

Gretschmann, K. (2015). 10 Measuring the Public Sector: A Contestable Issue. *The Public Sector: Challenge for Coordination and Learning, 31*, 189.

Gujarati, D. N. (1995). Basic Econometrics. McGraw-Hill Inc. New York.

Gupta, P., & Singh, A. (2017). A Summary Of Theories Governing Fdi Inflows In Developing And Developed Countries. *Journal of Academic Research in Economics, 9*(1), 71-85.

Güven, E. T. A., & Ayvaz, Y. Y. (2018). Relationship between inflation and economic growth: The case of Turkey 1990-2017 period Enflasyon ve ekonomik büyüme arasındaki ilişki: 1990-2017 dönemi Türkiye örneği. *Journal of Human Sciences, 15*(2), 766-778.

Hakimah, Y., Nugraha, A. T., Surya, A., Ananda, A. R. W., & Astuty, P. (2019). Does The Electricity Consumption Determine the Economic Growth And Energy Prices In ASEAN Countries? *Journal of Security and Sustainability Issues, 9*(2), 489–503.

Howe, A. (2016). Latin America and the nineteenth-century British free trade project. In *The Political Economy of Latin American Independence* (pp. 61-75): Routledge.

Huang, C. Y., Yang, Y., & Cheng, C. C. (2017). The growth and welfare analysis of patent and monetary policies in a Schumpeterian economy. *International Review of Economics & Finance, 52*, 409-426.

Hulten, C. R., & Ramey, V. A. (2017). Education, Skills, and Technical Change, and Future US GDP Growth-Introduction. In *Education, Skills, and Technical Change: Implications for Future US GDP Growth*: University of Chicago Press.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of economic dynamics and control, 12*(2-3), 231-254.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. *Oxford Bulletin of Economics and statistics, 52*(2), 169-210.

Jordaan, J. A. (2016). *Foreign direct investment, agglomeration and externalities: Empirical evidence from Mexican manufacturing industries*: Routledge.

Lim, H. E., & Lean, H. H. (2016). Effectiveness of a Cluster of Determinants to Increase Economic Growth Rate: A Combined Statistical Criteria Approach. *International Journal of Economics and Financial Issues, 6*(2), 728-735.

Moreau, V., & Vuille, F. (2018). Decoupling energy use and economic growth: Counter evidence from structural effects and embodied energy in trade. *Applied Energy, 215*, 54-62.

Muhammad, F., & Karim, R. (2015). Impact of expenditure on economic growth in Pakistan. International Journal of Academic *Research in Business and Social Sciences, 5*(2), 231-236.

Murindahabi, T., Li, Q., & Ekanayake, E. (2019). Do coffee exports have impact on long-term economic growth of countries?. *Agricultural Economics, 65*(8), 385-393.

Nugraha, A. T., & Osman, N. H. (2018). The environmental study on causality relationship among energy consumption, CO2 emissions, the value added of development sectors and household final consumption expenditure in Indonesia. *Ekoloji, 27*(106), 837–852.

Nyoni, T., & Mutongi, C. (2019). Modeling the long-run relationship between inflation and economic growth in Zimbabwe: a bi-variate cointegration (Engle-Granger Two-Step) approach.

Odhiambo, N. M. (2015). Government expenditure and economic growth in South Africa: An empirical investigation. *Atlantic Economic Journal, 43*(3), 393-406.

Öğrül, E., & Eryiğit, M. (2015). The factors that affect on foreign direct investments in Turkey (sectoral comparisons). *Theoretical & Applied Economics, 22*(3), 251-272.

Owolabi-Merus, O. (2015). Infrastructure development and economic growth nexus in Nigeria. *International Journal of Academic Research in Business and Social Sciences, 5*(1), 376.

Ozturk, I., & Acaravci, A. (2016). Energy consumption, CO2 emissions, economic growth, and foreign trade relationship in Cyprus and Malta. *Energy Sources, Part B: Economics, Planning, and Policy, 11*(4), 321-327.

Polyxeni, K., & Theodore, M. (2019). An empirical investigation of FDI inflows in developing economies: Terrorism as a determinant factor. *The Journal of Economic Asymmetries, 20*, e00125.

Rafindadi, A. A., & Almustapha, A, A. (2017). Growing the growth of the Ghanaian economy: Is the function of the country's financial development of any significance?. *Asian Economic and Financial Review, 7*(2), 206-221.

Rehman, N. U. (2016). FDI and economic growth: empirical evidence from Pakistan. *Journal of Economic and Administrative Sciences, 32*(1), 63-76.

Sengupta, P., & Puri, R. (2018). Exploration of relationship between FDI and GDP: A comparison between India and its neighbouring countries. *Global Business Review, 21*(1), 1-17.

Shrestha, M., & Chowdhury, K. (2005). ARDL modeling approaches to testing the financial liberalization hypotheses, Economics Working Paper Series 2005, University of Wollongong.

Tanna, S., Topaiboul, K., & Li, C. (2018). The Relative Importance of Trade vs. FDI-Led Economic Growth in Thailand. In *Foreign Direct Investments (FDIs) and Opportunities for Developing Economies in the World Market* (pp. 105-122): IGI Global.

Usman, O., & Agbede, E. A. (2015). Government expenditure and economic growth in Nigeria: A cointegration and error correction modeling.

Yenipazarli, A. (2017). Economic freedom and effects on economic growth: A time series analysis for Turkey. *Turkish Economic Review, 4*(3), 345-351.

Zakaria, K., Sarmidi, T., & Othman, R. (2017). Kesan Perbelanjaan Kerajaan Terhadap Kedatangan Pelancong ke Thailand. *International Journal of West Asian Studies, 8*(1), 28-42.

Zulkhibri, M., Naiya, I., & Ghazal, R. (2015). Structural change and economic growth in selected emerging economies. *International Journal of Development Issues, 14*(2), 98-116.