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LOOKING TOWARDS THE BIGGER PICTURE FOR ECONOMIC SUSTAINABILITY OF ASEAN COUNTRIES: ROLE OF CONSUMPTION, INVESTMENT AND DEBT GROWTH

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Abstract. The present study was performed in order to account for the changes in the economic sustainability in relation with the investment, growth of debt and consumption of resources. The study used panel data from six countries from the ASEAN region from the period between 1995-2018. The estimation of the regressors was performed on the basis of the AMG long run estimation. However, the tests of cross-sectional dependence, cointegration, unit roots were also performed on the tests. The AMG estimation reveals that for almost all countries the variables have significant and positive effects on economic sustainability. The results thus show that increases in investment, growth of debt and consumption have an increasing trend with the progress of economic sustainability. The Konya causal test was also performed on the data. Causal analysis shows that bidirectional associations exist between debt growth and economic sustainability and investment and economic sustainability. Whereas, unidirectional relationship from economic sustainability and consumption is observed to be present in the data. The current study is original as it uses the data from a different time period. These studies are important for the development of the ASEAN region. The study also provides some theoretical and policy-making implications.

Keywords: ASEAN; AMG; Konya causality; consumption; investment

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Jel Codes: O1, O53

1 Introduction

Economic stability is a term that can be used to describe the overall financial stability of any nation. The output of this financial system can be expressed in terms growth and low inflation rate. It is directly linked with the development across the nation and is affected by the actions and policies of the central bank. This paper focuses on how consumption, investment and debt growth affect the economic stability of the ASEAN countries. ASEAN stands for Association of South Asian Nations. The association has made prominent progress towards the free trade and economic integration in the region. The intra-ASEAN investments and trade were increased after the creation of ASEAN free trade area. This single market attracted an increasing number of foreign investments in 1992. In this group about more than 90 % of the trade goods are traded without tariffs. The market sectors that were integrated included tourism, agro based products, apparels and textiles, rubber based products, automotive and electronics (McClanahan, Chandra, Hattari, & Vis-Dunbar, 2014; N. N. H. L. T. Thao, 2014). Due to the differences in income of members of various industries many challenges arose during the economic integration. The import duties have also been reduced to zero in 2016 in order to promote the economic integration (Nafidah,

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2015; Naqiyah, Pengestuti, & Mahfudz, 2017). The human development index of the ASEAN countries can be seen in the following table 1.

Table 1: Human Development Index (2018)

Country	Human Development Index (2018)	
Singapore	0.935 (highest)	Very high
Brunei	0.845	Very high
Malaysia	0.804	Very high
Thailand	0.765	High
ASEAN	0.723	High
Philippines	0.712	High
Indonesia	0.707	High
Vietnam	0.694	Medium
Laos	0.604	Medium
Myanmar	0.584	Medium
Cambodia	0.581 (Lowest)	Medium

The Asian Development Bank was given the responsibility for calculating the feasibility of the basket and for the construction of the basket. The overall goal was to increase the financial stability of the regional economy and the price stability as well. The cost of cross border business was lowered due to the reduction in the currency risk. As a result of this the goods and services became cheaper due to the increased trade. This lead to the improvement in the economic stability for the countries since (Yoo, 2006; Yunling, 2008). The GDP growth of ASEAN countries with respect to the other countries can be seen in the following figure 1. The time period for the calculation of GDP growth is from 2008 to 2017.

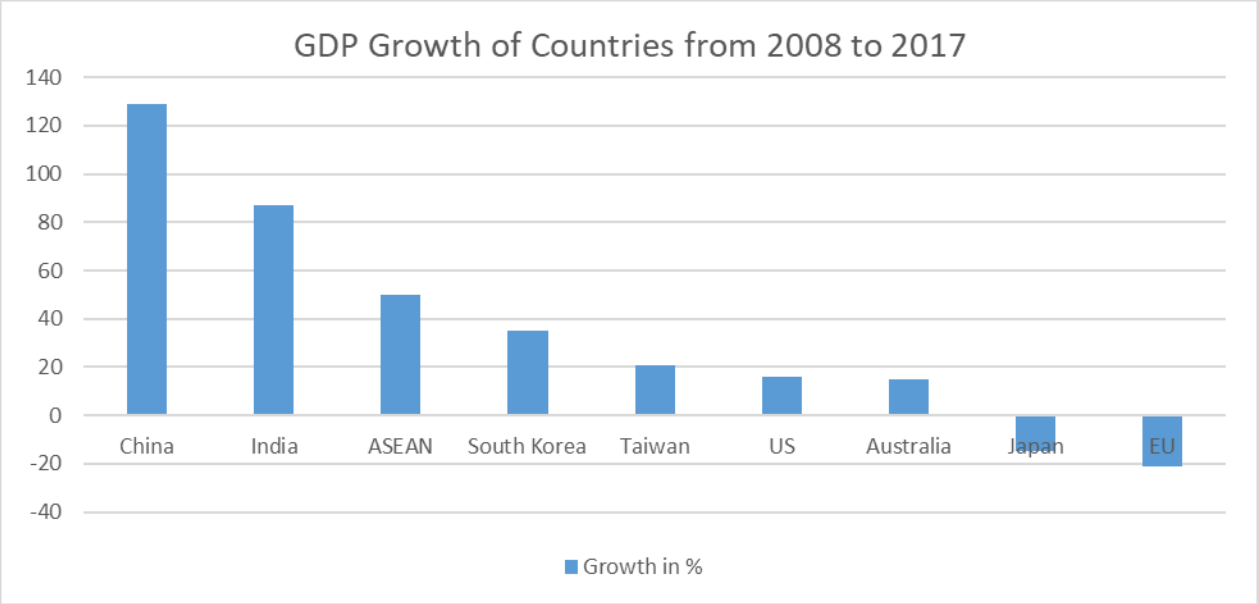

Figure 1: GDP Growth

It can be seen that the ASEAN countries have seen a significant increase in their GDP. They have shown a 50 % growth rate. The main reasons behind it is the increased trade and currency stability. The individuals were able to

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purchase the goods and services at moderate rates. The stability attracted more and more foreign investors which led to further economic development (Ahmad & Harnhirun, 1996; Heidari, Katircioğlu, & Saeidpour, 2015). The consumption of the goods and services was increased due to the reduced rates which were resulted from the currency stability and cross country trade. The association has been working for the development of the political and economic stability of the countries and has shown prominent results. The association has a network of foreign alliances that has helped tremendously in increasing the foreign direct investment. It is involved in many international affairs, diplomatic issues and dialogues. Along with all this the association has been working on decreasing the debt of all its members through numerous ways. Each country supports the other in times of need and economic instability. This is one of the main reasons behind the creation of this association (Anorou & Ahmad, 2000; Rudra P Pradhan, Arvin, Hall, & Bahmani, 2014).

2 Literature Review

The paper focuses on analysing the impact of consumption, investment and debt growth on economic stability of ASEAN countries. Each of these impacts is discussed ahead.

2.1 Relation between Resource Consumption and Economic Stability of ASEAN countries

Resource consumption can be defined in terms of consumption of renewable resources and non-renewable resources. It may refer to the water consumption, environmental degradation and exploitation, resource depletion, fishing, deforestation, oil consumption and oil depletion, natural gas consumption and depletion and energy consumption. It can be defined in terms of natural resources as well as economic resources. In most cases the measures used for this calculation include resource efficiency and resource intensity (Azam, Khan, Bakhtyar, & Emirullah, 2015; C.-C. Lee & Chang, 2008; Monni, Palumbo, & Tvaronavičienė, 2017; Yeganeh Kia, 2020; El Idrissi, Ilham Zerrouk, Zirari, & Monni, 2020; Tvaronavičienė, & Ślusarczyk, 2019). Globalized markets and industrialization have increased the overall consumption of resources. The overconsumption of resources has a negative impact on the economic stability it results in resource depletion. The economic resources of a country include the services and goods that the country is able to provide to its population (Yildirim, Aslan, & Ozturk, 2014; Yoo, 2006). One of the main reasons for the formation of Association of South Asian Nations was to help and increase the economic stability of all its members' nations (Hussain et al., 2019). The two main objectives of the associations that led to increased consumption of economic resources and economic stability were monetary union and the free trade. Both of these increased the trade between the countries that were members of the association. The increased trade and decreased financial pressure led to the availability of the goods and services at cheaper rates. Due to a significant decrease in the charges of goods and services, their consumption increased (Granada & Mejia, 2020; Lean & Smyth, 2010; Yildirim et al., 2014). The individuals in the population started spending more amount on the services and goods as a result of which the industries started to flourish. The trade was made tariffs free so that the industries and companies would not have to worry about the additional taxes and bear the burden to extra expense. The industrial development increased in the ASEAN countries along with the increased trade. The monetary union eliminated the risk of currency rate fluctuation. There were many obstacles in the way but the association managed to bring all the members into a single currency basket. The elimination of this risk was very beneficial for the increased trade and helped in bringing the inflation down. With the increase in the consumption of economic resources the industries flourished. The industrial development is one of the fundamental elements of economic stability. The revenues generated through the industrial development contribute to the national GDP. Over the years the GDP of the ASEAN countries have increased 50% from 2008 to 2017. There is however another factor that needs to be considered here. The goods and services that are being imported by the country from other countries outside of the association (Dixon, 1990; Tuna & Tuna, 2019). If the consumption of such resources increases then the pressure on the imports also increase. In this case the economic stability decreases. The main aim of the association was to decrease this pressure.

Hypothesis one (H1) is that the resource consumption has a significant impact on the economic stability of the ASEAN countries.

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2.2 Relation between Investment growth and Economic Stability of ASEAN countries

Investment includes all the economic assets that any country has that can be used for generation of wealth in the future. The economic investments of any country include all the investments in the country and in the other countries as well. The foreign investments are one of the major assets of any country. The sound investments at business level are directly linked with the economic growth. The total outputs of the businesses increase on mass level (Rudra P Pradhan et al., 2014; Yoo, 2006). As a result of this the GDP of the country increases. The increase in the GDP promotes economic growth and support the economic stability. As mentioned before the ASEAN countries promoted the free trade and monetary union. The overall goal was to increase the financial stability of the regional economy and the price stability as well. The cost of cross border business was lowered due to the reduction in the currency risk. As a result of this the goods and services became cheaper due to the increased trade. This lead to the improvement in the economic stability for the countries since. It can be seen that the ASEAN countries have seen a significant increase in their GDP (H. H. Lee & Tan, 2006; Srinivasan, Kalaivani, & Ibrahim, 2010). They have shown a 50 % growth rate. The main reasons behind it are the increased trade and currency stability. The individuals were able to purchase the goods and services at moderate rates. The stability attracted more and more foreign investors which led to further economic development. The consumption of the goods and services was increased due to the reduced rates which were resulted from the currency stability and cross country trade (Abidin, Haseeb, Azam, & Islam, 2015; Rudra Prakash Pradhan, 2009). The association has been working for the development of the political and economic stability of the countries and has shown prominent results. The association has a network of foreign alliances that has helped tremendously in increasing the foreign direct investment. It is involved in many international affairs, diplomatic issues and dialogues. This increased the inward and outward foreign direct investments. The inward foreign investments brought the latest technology and foreign currency to the ASEAN countries. The inflow of foreign currency became another one of the factors contributing to the support of the national GDP (C. G. Lee, 2009; Zhu, Duan, Guo, & Yu, 2016). The outward foreign investment helped in increasing the national revenue as well. The local investments resulted in improvement of the local economy. The revenue generated through the local businesses also contributed to improvement of the financial stability of the country (Kuppusamy, Pahlavani, & Saleh, 2008). Thus it can be derived that the investments have had a positive impact on the economic stability of the ASEAN countries.

Hypothesis two (H2) is that the investment growth has a significant impact on the economic stability of the ASEAN countries.

2.3 Relation between Debt growth and Economic Stability of ASEAN countries

The global industrialization has encouraged the countries to invest in human capital, technological development, machine learning and artificial intelligence. The huge investments at international level are being done in order to keep up with the increasing competition world-wide. Investing in such major areas require huge amount of funds (Makin, 2005; Simarmata, 2013). The countries that have fewer trades and less international investment require external support for financing their economic development. The countries like Indonesia have to face natural disasters very often. Thus they require additional funds for such natural disasters. The funds can be collected from foreign and domestic sources. The increasing debt may solve the problem at hand but are linked with the increase in national liability. Now if the debt is collected from domestic or foreign sources than the government of the country is forced to increase the taxes on the population in order to cover the amount of the debt. This results in increasing inflation and unrest among the business circles. The increased taxes decrease the purchasing of goods and services that are essential components in driving the economy of the countries (Rahim & Saad, 2014; P. Thao, 2018). The domestic investments are reduced due to the inflation. The overall balance between the expenditure and revenue is upset. The cost of living in the country increases and the financial pressure on the population increases as well. The economy of the country is able to grow optimally of the percentage of national debt is less

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than 90 %. Most of the ASEAN countries are developing countries and at some time have relied on external financial aid. This led to the increased liability at national level. When this debt increased the financial pressure on the population increased as well (James, Naya, & Meier, 1989). As a result of all this a major portion of the national revenue generated is used in paying off a debt and is not used on economic development. The investments and trade decreased due to increased taxed so the revenue decreased as well. This way the increasing debt is linked with economic instability in the ASEAN countries.
Hypothesis three (H3) is that the debt growth has a significant impact on the economic stability of the ASEAN countries.

3 Methodology

3.1 Data

In this study the data for consumption, investment, debt growth and economic sustainability has been collected from the ASEAN countries for the period of 1995-2018. Two control variables i.e. per capita income and exports have also been used in the study. The variables have been defined as follows; the economic sustainability is measured in terms of GDP divided by the Co2 emissions per capita and it has been measured in constant 2010 US dollars. Investment is measured through the gross capital formation which is the account of the total additions in the fixed capital accounts of the country and also accounts for the changes in inventories. Investment is also measured in terms of US dollars. Debt-growth is defined as the total increase in the level of debt internal and external owed by the country, it is measured in constant US dollars. Consumption is defined as the use of goods and services by the households or residents of an economy. For measuring consumption level, the study has used the metric of GNI, which is the gross national income and it is measured in terms of constant US dollars. The data has been collected from the World bank from its database. The data regarding six ASEAN countries has been collected i.e. Thailand, Cambodia, Indonesia, Laos, Brunei and the Philippines.
In this study the relationship between economic sustainability, investments, debt growth and consumption were estimated through the following regression equation;

$$ECS_{i,t} = \beta_0 + \beta_1 CON_{i,t} + \beta_2 INV_{i,t} + \beta_3 DEG_{i,t} + \beta_4 PCI_{i,t} + \beta_5 EXP_{i,t} + \varepsilon_{i,t} \quad](1)$$

Where β_0 is the intercept that measures the effect of the dependent variable ECS, β_1, β_2, β_3,are the coefficients of the independent variables; consumption, investment and debt growth where β_4 and β_5 are the coefficients of the control factors PCI and exports. In equation 1 the subscript 'i' denotes the countries and the subscript't' is used for the specific period under consideration.

3.2 Cross-sectional dependence test

As a consequence of the globalization of the nations of the world and the increasing economic integration, the dependence and association uniting the cross-sections in panel facts is expected. If the associations among the transverse data isn't considered, then misleading results are produced which eradicate the authenticity and credibility of the study. The study followed the method used by Breusch and Pagan (1980) for testing the cross-sectional vulnerability.

$$CD_{BP} = \sum_{i=0}^{n-1} \sum_{j=i+1}^{n} \rho^2_{i,j} \quad (2)$$

However, this test statistic presents a disadvantage in cases where N i.e. the number of cross-sections is large and therefore it cannot relate in such scenarios (N is large and N leads towards ∞). In order to overcome this issue Pesaran (2004) introduced the LM statistic

$$CD_{LM} = \sqrt{1/N(N-1)} \sum_{i=0}^{n-1} \sum_{j=i+1}^{n} (T\,\rho^2_{i,j} - 1) \quad (3)$$

According to Pesaran the above-mentioned statistic is to be used when the cross-sectional size is greater than the time dimension T

$$CD = \sqrt{2T/N(N-1)} \left[\sum_{i=0}^{n-1} \sum_{j=i+1}^{n} T\,\rho_{i,j}\right] \quad (4)$$

Where the term $\rho_{i,j}$ is used to indicate the correlation among the errors.
The study also analyzes the slope homogeneity by using the test designed by Pesaran and Yamagata (2008).

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$$\Delta=\sqrt{N}\left[\frac{N^{-1}S-k}{\sqrt{2k}}\right] \quad (5)$$

3.3 Panel Unit root test

The next test applied on the data is the panel unit root test which is applied to test the stationary levels of the variables by using the CIPS panel unit root test, this test accounts for the cross-sectional dependence among variables. The following regression was used for the cross-sectional augmented DF,

$$\Delta Y_{i,t} = \alpha_i + b_i Y_{i,t-1} + c_i Y_{t-1} + d_i \Delta Y_t + \varepsilon_{i,t} \quad (6)$$

$$CIPS = \frac{1}{N}\sum_{i=1}^{N} CADF \quad (7)$$

3.4 Panel Co-integration Test

The cointegration i.e. the correlations between the time series data is analyzed on the basis of the Westerlund and Edgerton (2007). The following test statistics have been used;

$$LM_N = \frac{1}{NT^2}\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{w}_i^{-2}S_{it}^2 \quad (8)$$

Where the term S_{it}^2used to demonstrate the partial sum of the error terms, $\hat{w}_i^{-2}$ is used to show the long-run variance of the error terms. The long run estimates of the model have been computed by using the AMG compotators that take the heterogeneity of the cross sectional units and the vulnerability into consideration (Eberhardt & Bond, 2009).

3.5 Panel Causality Test

The causality analysis was performed in order to study the causality among the economic sustainability, consumption, debt growth and investment. The test developed by Kónya (2006) has been considered. The observation of the cross-sectional dependence doesn't appear, and it can be executed on non-stationery and series that do not co-integrate as well.

4 Results

Table 2 indicates the outcomes of the cross-sectional dependence (CSD) and the slope homogeneity results. The zero hypothesis for the CSD test is that if the probability evaluate are weaker than the significant statistics then the null hypothesis is deserted. The null hypothesis contends for no cross-sectional dependence, whereas the alternate hypothesis states a presence of CSD among the study variables. According to the results of the CD_{BP}, CD_{LM} and CD the zero hypothesis of the cross-sectional dependence test is rejected. The * demonstrates significance at the 1% level of positive and the ** is used to depict the importance at the 5 percent level. The results intimate that there is presence of CDS among the variables included in the study. The slope test is conducted to evaluate the homogeneity properties of the dataset. The null hypothesis for this test expresses the presence of homogeneity whereas the alternate hypothesis expresses the presence of heterogeneity. According to the outcomes of the delta computations, the assumption of homogeneity has been denied and the coefficients are found to be heterogeneous.

Table 2: Cross-Section Dependence and Slope Homogeneity Tests Results

Variable	*CD_{BP}*	*CD_{LM}*	*CD*
CON	180.884*	78.384*	48.493*
INV	184.378**	94.498**	41.884**
DEG	167.188*	78.498*	39.998*
EXP	189.688*	68.498*	35.498*
PCI	156.983*	97.976*	53.499*
ECS	187.287**	69.578**	63.298*
Slope Homogeneity Tests Results			
Tests	LM Statistics	t-value	P-Value
Delta	63.89	5.302	.009
Adj Delta	29.09	3.283	.042

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Table 3 presents the results of the CIPS panel unit root test. The null hypothesis for the unit root (UR) test is that there is presence of UR issues in the variables whereas the alternate hypothesis contends for the absence of unit root and presence of stationarity of the data. The panel unit root test is performed in order to evaluate the stationary properties of the variables and also to find its order of integration. Table presents the results of the CIPS panel UR test. The results show that the investment, debt growth, exports and economic sustainability are stationary at level, with 1 percent level of significance. Whereas at the premier difference all variables are stationary and do not present UR issues, thus the null hypothesis is rejected. The series are unified at the first order I(1).

Table 3: CIPS Panel Unit Root Test Results

Variable	At Level	First Difference
CON	-4.1343	-8.113**
INV	-2.3384*	-7.312**
DEG	-0.3944*	-5.284*
EXP	-3.3394*	-7.392**
PCI	-2.3944	-6.940**
ECS	-3.2384*	-9.394**

The LM Bootstrap test has been performed next in order to verify the presence of cointegration or long run associations. Table 4 presents the results of this analysis. If the Bootstrap p -value is less than the LM statistic value, then the null hypothesis i.e. absence of co-integration is rejected. As the table demonstrates the values of the bootstrap probability are less than the LM statistics therefore the null hypothesis is rejected and the alternate hypothesis that verifies the presence of long run relationship between the variables is accepted. The table values show that ECS, PCI, EXP, CON, INV and DEG are associated with each other in the long run.

Table 4: LM Bootstrap Panel Co-integration Test findings

Conditions	**LMstatistics**	**Bootstrap p-value**
Constant	2.499	0.674
Constant + Trend	11.393	0.109

The AMG estimators have been used for measuring the strong relationships among the variables. The results have been listed in table 5. The results for consumption indicate that it has a favorable impact on the economic sustainability for five ASAEN countries; the results are significant for all but Brunei. The impact for Cambodia is at 5% level of positiveness and for Indonesia, Laos, Thailand and Philippines the results show 1 percent level of significance. The results manifest that increase in the consumption patterns in these countries lead towards economic sustainability. Investment is favorable at the 1% level of favorable in Brunei, Cambodia, Indonesia and Philippines. Increases in investment in these countries have significant effects on their economic sustainability. Debt growth is significant for all six countries and shows that the increase in debt will be beneficial for the economic sustainability. Exports and per capita income are also significant mostly and show positive effects on the economic sustainability of the countries.

Table 5: AMG Estimation Results

Countries	**CON**	**INV**	**DEG**	**EXP**	**PCI**
Brunei	0.038	0.123*	0.229**	0.139**	0.183***
Cambodia	0.234**	0.129*	0.204*	0.288**	0.218**
Indonesia	0.294*	0.284*	0.294**	0.046	0.283**
Laos	0.387*	0.023	0.283*	0.052	0.386**
Thailand	0.210*	0.043	0.394**	0.399**	0.289*
Philippines	0.309*	0.384*	0.193***	0.293**	0.399**
Penal	0.583***	0.405*	0.422**	0.424***	0.382**

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Table 6 reveals the findings of the panel causality tests. The decision rule is simple, the relationships with probability values less than 0.05 show causality. From the results depicted in table 5 it can be seen that economic sustainability causes consumption i.e. there is presence of a uni-directional relationship between ECS and CON. There is existence of bi-directional causality among ECS and INV and ECS and DEG. The causal associations among the independent variables have also been explored. Bidirectional causality exists between INV and DEG and INV and CON whereas there is existence of unidirectional causality between DEG and CON i.e. DEG causes Con but CON does not cause DEG.

Table 6: Kónya Panel Causality Test Results

Null Hypothesis:	F-Statistic	Prob.
ECS does not Granger Cause CON	2.336	0.0533
CON does not Granger Cause ECS	3.320	0.5332
ECS does not Granger Cause INV	3.723	0.0512
INV does not Granger Cause ECS	5.736	0.0044
ECS does not Granger Cause DEG	3.201	0.0643
DEG does not Granger Cause ECS	4.138	0.0473
CON does not Granger Cause INV	5.310	0.0043
INV does not Granger Cause CON	4.730	0.0004
CON does not Granger Cause DEG	6.628	0.5382
DEG does not Granger Cause CON	4.738	0.0304
INV does not Granger Cause DEG	2.298	0.0323
DEG does not Granger Cause INV	6.283	0.0054

5 Discussion

This research has concentrated on studying the nexus between the economic sustainability, consumption, investment and debt extension of the six ASEAN economies under consideration. For this purpose, the researcher employed the use of AMG estimators and Konya causality as well. Similar studies targeting the relationship between the economic sustainability and its indicators have been carried out by researchers (Dinçer, Yüksel, Adalı, & Aydın, 2019; Mahalik, Babu, Loganathan, & Shahbaz, 2017). A study by Nasir, Huynh, and Tram (2019) focused on the economic growth, financial development and the ecological developmental consequences i.e. increasing Co2 emissions in the developing ASEAN states. The study employed the use of FMOLS and DOLS method to evaluate the associations among the variables. The study found that long run development and investment is positive for economic growth but poses serious degrading effects on the environment (Ślusarczyk, Haseeb & Hussain, 2019). The results of this study also show that the increase in consumption and investment relates positively with the economic sustainability. Another study by Kim, Ha, and Kim (2017) focuses on the dimensions of public debt and EG. The findings intimate that the increase in public debt relates with the economic sustainability of the country. The causal relationship as assessed by the causality test also verifies that there is a causal connection among debt growth and economic sustainability. The study by Ouyang and Li (2018) studies the association among the energy consumption, financial growth and economic sustainability in china. The study applies the GMM and VAR model on a panel of 30 Chinese provinces in order to study the country wide effects among these variables.

5. Conclusion

The major purpose of this paper was to evaluate the relationships between the economic sustainability, investments, consumption patterns and debt growth effects on the ASEAN countries for the selected time period. The relationships among the explanatory and the outcome variables was assessed as they are associated with each

other and converge together to produce a sustainable economy. Several econometric tools for the purpose of analysis of different dimensions of the data, the Pesaran CSD test, the CIPS panel unit root test, slope homogeneity test, cointegration analysis, AMG long run estimation and the Konya causality were used to verify different dimensions of the data. The analysis shows that the relations between the consumption, debt growth, investment and economic sustainability are significant. The causal analysis shows that bidirectional associations exist between debt growth and economic sustainability and investment and economic sustainability. Whereas, unidirectional relationship from economic sustainability and consumption is observed to be present in the data.

5.1 Limitations

The study has some limitations; the study only uses the data from 1995-2018, it is advised to use a bigger dataset in the future so that the effects and relations can be analyzed. This study employs the use of time series and panel data which is subject to issues like cross-sectional dependence and heterogeneity. The study only focuses 3 explanatory variables, the effects of other variables should also be included in the study. The present research is only limited to six of the ASEAN countries, these relations need to be analyzed for the other four ASEAN countries as well.

5.2 Implications

This study also poses some theoretical and policy making implications. The study focuses on six ASEAN countries and provides details regarding their relationship with economic sustainability and important indicators like investment and consumption. The studies focusing on the ASEAN countries are limited thus this study has important academic and theoretical implications. Moreover, the policy makers can use this study to formulate important policies regarding debt, consumption and investment strategies by integrating them with the economic growth and sustainability.

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