BRINGING VARIOUS DIMENSIONS OF CREDIT OF ASEAN COUNTRIES FOR SCRUTINY: IMPLICATIONS ON SUSTAINABLE ECONOMIC GROWTH

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Abstract. This study has used data from the ASEAN region in order to study the relationship among the various dimensions of credit and sustainable economic growth. The objective of this study was to analyze the effects of the credit dimensions on the economic growth for the period 1995-2018. The estimation of regressors was performed on the basis of the one step system of generalized method of moments and the panel corrected standard approach methods. The dynamic and static estimations reveal that the effect of household credit on the economic growth is insignificant whereas business credit, mortgage credit, consumer credit and private sector credit were found to be positive and significant. The current study is original in the sense that the study has been performed with a new dataset and the focus variables are also different. Such studies are important for the ASEAN region as the region is developing as the region is under development, and the level of credit available is one of the primary indicators of the economic performance or ability of a country. Also, this study has used an estimation method that account for the problems of panel data, specifically the issues created by the cross-sections and heterogeneity. The study also has important theoretical and policy-making implications.

Keywords: ASEAN; LLC; Mortgage credit; business credit; sustainable economic growth

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1 Introduction

Economic growth happens when the real output is increased over time. In order to measure the real output the Gross Domestic Product (GDP) of the nation is monitored at constant prices. By making the prices constant the impact of the increase in prices on the value of the country's national output is eliminated. A sustainable economic growth can be described as steady growth rate that can be maintained over time without leading to other major economic problems. The problems to be considered here are present ones as well as the problems and issues that the future generations might have to face. In many cases that rapid economic growth requires a lot of resources (W. E. James, Naya, & Meier, 1989; Kheng-Lian & Robinson, 2002; Baltgailis, 2019; Prasetyo, & Kistanti, 2020; Humbatova, Tanriverdiev, Mammadov, & Hajiyevev, 2020, Khalatur, Khaminich, Budko, Dubovych, & Karamushka, 2020).

If the resources are consumed at a rapid pace than they are may be depleted for the future generations causing many new environmental problems for them. This may include global warming and the depletion of resources such as fish stocks and oil. The growth periods are affected by the increase in the aggregate demand. This includes the increase in the consumer spending. If the output is not increased along with the increasing demand than the price level will be forced to increase due to the extra demand. The ASEAN countries are working together on achieving a strong growth overall (Huber, Roger, & Hamacher, 2015; Roh, Thai, & Wong, 2016). The average growth rate per year to up till 2018 has been 5.2 %. The association has been working on improving the economic welfare by lowering poverty and bosting incomes. The GDP growth of Indonesia can be seen in the following table 1. These values have been taken from the Asian Development Bank.

Table 1: Indonesia GDP growth in percentage

Year	Indonesia GDP growth in percentage
2017	5.1 %
2018	5.2 %
2019	5.1 %
2020	5.2 % (forecasted)

At the same time it is essential to analyse the factors affecting the economic growth in these countries. In this paper we are analysing the impact of the credit on the sustainable economic growth in the ASEAN countries. The term credit is used for a wide range of purposes in the financial world. In most cases the term credit is used to define any contractual agreement that is between the borrower and the lender (Chua & Scura, 1991; Koh, 2007). The borrower is the individual or the party that receives something valuable whereas the lender is the individual or part that lends that valuable asset and agrees to pay back on a future date with interest. The purchase of goods and services that are paid for at a later date are also included in this (Cuyvers, 2014; Hill, 1994). It can be on any scale. It may be an individual getting credit from a bank for his daily needs or a business obtaining credit for expansion (Gómez-Fernández & Albert, 2020).

The term debt can also be used to describe the situation as the money is to be paid in the future. The credit or debt may be obtained on the national level in order to boost the economy or the GDP. There are many forms of credit. The most common types of credit include lines of credit, signature loans, mortgages and car loans.

For any country to have a sustainable development it is essential to keep track of the debt or credit as it can become a huge burden on the future generations. The national debts are mostly in very large amount sand it takes time and effort to pay them off (Shome & Tondon, 2010; Wei-Yen, 2005). The ASEAN countries have been working on controlling the credit. The national debt of Indonesia can be seen in the following figure 1.

Figure 1: National Debt

It can be seen that the national debt has been increasing over the years. Instead of being paid back the debt is slowly accumulating. This is going to be a burden of the future governments (Shome & Tondon, 2010; Wong, 1979). The small scale debts also have an impact on the economic growth of any country.

2 Literature Review

The different dimensions of credit under consideration in this paper include Mortgage Credit, Household credit, Consumer credit, Business credit and Private sector credit. We will analyse the impact of each of the above on the sustainable development in the ASEAN countries.

Relation between Mortgage credit and Sustainable Economic growth in ASEAN Countries

A mortgage is a loan that is taken for the sole purpose of purchase of property or real estate. The loan enables the lender to take possession of the borrower's property. The legal mechanism supports the lenders possession of the property (Hameed, Basheer, Iqbal, Anwar, & Ahmad, 2018; Lestari, 2016; Pradhan, Arvin, Hall, & Bahmani, 2014). In case the lender is unable to pay back the amount in the pre-agreed amount than legal action can be taken against him. Property can be mortgaged for business, residential or investment purposes. For mortgages the lender is mostly a financial institution like bank, building society and credit union (Cooperation & Nasional; Lim, 2009). Studies have shown that in ASEAN countries the increased mortgage credit is linked with the increase in the imports of the country. As a result of this the mortgage credit has an impact on the gross domestic product of the nation. The increase in mortgage credit causes an increase in the trade deficit (Chaisrisawatsuk, 2016; Sotharith, 2013). Trade deficit forces the country to increase the rate of imports. The imports of the country have a significant effect on the economic growth of the country. Without significant exports, the increasing imports causes significant fund deficits on national level.

Hypothesis one (**H1**) is that the mortgage credit has an impact on the sustainable economic growth in the ASEAN countries.

Relation between Household credit and Sustainable Economic growth in ASEAN Countries

The household credit can be defined as the overall debt of all the individuals in any household. It includes all the mortgage loans, home equity loans, student loans, auto loans and consumer debt. Many economists have argued that lowering the debt is necessary for economic recovery (Gochoco-Bautista & Remolona, 2012; Nguyen, Skully, & Perera, 2012). Household debt can be used for the measurement of economy as it reflects per capita income. Many researchers have been analysing the impact of household credit and economic growth. The dynamics through which the household credit affects the economic growth is very ambiguous. The high household credit results in higher consumption by the home owners. As a result of this a greater share of the economic output is consumed (Tullao Jr, Cabuay, & Hofileña, 2018). The increased consumption results in account deficit. In cases where the account deficit of the country increases the rate of imports is also increased to meet the demands. After the economy enters the recession phase however, the imports decrease dramatically. The overall exports of the country then increase and the rate of exports becomes greater than that of the imports. This whole mechanism allows any nation that is consumed in debt to start selling goods again and keep up with the world economy (Dikko & Madi, 2015; Wattanapruttipaisan, 2003). This mechanism works well only when the other countries have constant household debts. In case the household credits of those countries also fluctuate than this mechanism is not efficient. If the household credit of many countries start to increase than the nations will have no place to export their services and goods. This will affect the nation's ability to maintain a steady and sustainable economic growth (Hill, 1994; Sawada & Zen, 2014; Thornton & Molyneux, 1996).

Hypothesis two (**H2**) is that the household credit has an impact on the sustainable economic growth in the ASEAN countries.

Relation between Consumer credit and Sustainable Economic growth in ASEAN Countries

Consumer credit can be defined as the personal debt that is taken in order to purchase the services and goods. A credit card is one of the examples of consumer credit. Any type of personal loan can be categorised as consumer credit. It is however not the debt that is taken in order to purchase a house or property (Abonyi, 2012; Thornton & Molyneux, 1996). Consumer credit is granted by retailers and banks so that the goods and services can be purchased at the time being and the payment is returned in the future with pre decided amount of interest. This type of debt can be divided into revolving credit and instalment credit. Studies have shown that in ASEAN countries the increased consumer credit is linked with the increase in the imports of the country (Dikko & Madi, 2015; Nottage, Malbon, Paterson, & Beaton-Wells, 2019). As a result of this the consumer credit has an impact on the gross domestic product of the nation. The increase in consumer credit causes an increase in the trade deficit. Trade deficit forces the country to increase the rate of imports. The imports of the country have a significant effect on the economic growth of the country. Without significant exports, the increasing imports causes significant fund deficits on national level (Dee, 2011).

Hypothesis three (**H3**) is that the consumer credit has an impact on the sustainable economic growth in the ASEAN countries.

Relation between Business credit and Sustainable Economic growth in ASEAN Countries

Any form of credit or loan that is given to an individual or a company for business purposes is described as business credit. This loan can be used for the purchase of goods and services that are required for normal operations of any business. It can also be termed as trade credit. There are many ways in which a business credit can affect the sustainable economic growth of ASEAN countries. Most of the business loans are granted to the small and medium enterprises that are struggling to become successful. These credits give such enterprises support to grow and earn revenue. Banks carefully grant the loans to the credit worthy parties (Dee, 2011; Wattanapruttipaisan, 2003). Having access to funds help increase the rate of development in the industry. The income levels of the individuals increase. Rate of employment increases. Such loans allow the poor business setups to be able to avoid the liquidity constraints. The lack of funds or lack of access to funds can be a huge problem for the ASEAN countries. The small scale business enterprises are essential for the growth and

development of the economy. With the development in the industrial sector the exports of the country increase (K. James, 1986; Lubis, Bustaman, & Riyanti, 2015). As the ASEAN countries have implemented a no tariff trade so the trade and exports become easier. The revenue generated by the industrial sector and small scale enterprises provide extra support to the existing economic structure and provide a steady and sustainable economic growth.

Hypothesis four (**H4**) is that the business credit has an impact on the sustainable economic growth in the ASEAN countries.

Relation between Private sector credit and Sustainable Economic growth in ASEAN Countries

Private sector credit or domestic credit refers to the financial resources that are provided to the private setups by the financial corporations like banks. In a wide range of countries the funds are given to the public enterprises. The provision of financial aid to the private enterprises help boost the economic activities in the country. The funds are provided by the foreign exchange companies, pension funds, insurance corporations, money lenders and leasing companies. The economic activities help to improve trade. The spending per capita increases and the revenue generated by the private enterprises help in the development of national GDP. The rate of exports increase and more revenue is generated by the country (Bruch & Hiemenz, 2019). This trend has been prominent in the ASEAN countries. The revenue generated by the private sector and small scale enterprises provide extra support to the existing economic structure and provide a steady and sustainable economic growth. Without the financial support from the corporations the private sector corporations are unable to perform efficiently and thus are unable to contribute to the national revenue.

Hypothesis five (**H5**) is that the private sector credit has an impact on the sustainable economic growth in the ASEAN countries.

3 Methodology

Based upon the different panel data studies (Mekhum, 2020; Rahman, Rana, & Barua, 2019) the following panel data regression equation or framework is being used in the study;

$$EG_{it} = \alpha + \beta_1 MC_{it} + \beta_2 BC_{it} + \beta_3 HC_{it} + \beta_4 PC_{it} + \beta_5 CC_{it} + \varepsilon_{it} \quad (1)$$

In the equation mentioned above α is the constant, subscript 'i' is being used for the country, t is used for demonstrating the year or period under consideration, the term α is the intercept that measures the change in the dependent variable EG and the coefficients β_1 , β_2 , β_3 , β_4 and β_5 are the slope coefficients that are used to measure the changes being produced in the dependent variable as a consequence of increase in the explanatory variables where ε_{it} is the error term or the disturbance term.

Data

The study uses annual macroeconomic data from the ASEAN countries, which is a group of ten regionally progressive and developing countries (Malaysia, Thailand, Indonesia, Singapore, Vietnam, Cambodia, Philippines, Laos, Burma and Brunei). The data has been collected from the region over the period of 1995-2018. For economic growth the study has GDP constant US dollars, For the mortgage, business, household, consumer and private sector credit the study has used national estimates of these indicators. The data regarding these indicators was available on the database of world bank, World Development Indicators. The data collection process is of imperial importance in any empirical research, and the credibility of the research process depends upon the data collection method. Therefore in order to maintain the credibility and accuracy of resources the secondary data has been collected from the credible database of WDI.

Unit Root Test

In order to verify the orders of integration as well as the stochastic properties of the variables the study has used the Levin-Lin-Chu (LLC) unit root test (Levin, Lin, & Chu, 2002). The panel unit root test is more advantageous than the generic time series approach as it permeates the issues of power and size of the time series methods. The LLC is an extension of the unit root test as mentioned in the ADF technique, adjusted for the time series approach. The LLC unit root test is carried out on the null assumption that the variables suffer from the unit root issues and the alternate hypothesis is that there is no unit root in the series. Also, the method assumes that the same autoregressive process occurs across the cross-sections. The following equation is used to express the structure of the unit root equation;

$$\Delta y_{i,t} = \alpha_i + \rho y_{i,t-1} + \sum_{j=1}^{p_i} \Delta y_{i,t-j} + \varepsilon_{i,t}$$

Panel Cross-sectional dependency and Diagnostic Tests

Cross-sectional issues and dependence are a recurring issue in panel data studies, especially when the dataset is comprised of countries that are regionally similar and depict similar economic, financial and political frameworks. The ASEAN countries regionally belong to the same area, moreover their economic and financial structures are almost similar. Cross-sectional dependence is a common issue observed in panel data regressions to present with issues, furthermore issues like heteroskedasticity, autocorrelation and multicollinearity are common as well. Thus, the unit roots and diagnostic tests that take these issues into account will be performed on the data in order to maintain precision and robustness of results. It is forecasted that the panel data set will present with issues like cross-sectional dependence and heteroskedasticity thus, the models or methods consistent with these issues are being used for estimation of regressors so that the effect of these problems can be mitigated (Hussain, Anwar & Razimi, 2020).

PCSE Estimation

The techniques of static and dynamic estimation are being applied in this study. The Prais-Winsten regression method has been used for the application of the dynamic effect which has a correlated PCSE. The study uses the systematic generalization method of moments for the static estimation by using the one step approach. These methods account for the country fixed and time fixed effects so that the heterogeneity that results from such estimations can be accounted for. The PCSE estimation technique is efficient in such scenarios as it operates with the basic assumption that the error terms are heteroscedastic and have correlations across the panel (Greene, 2012). The following model has been used to account for the country fixed and time fixed methods proposed by the PCSE method;

$$EG_{it} = \alpha + \sum \beta_j X_{it} + \sum \delta_j GDP_{dum,j} + \sum_{j=1} \theta_j Y_j + \varepsilon_{it} \quad (2)$$

In the equation stated above the term α represents the constant or the slope for the equation, i is used to account for the different countries included in the panel, t is used to depict the year or period under consideration, X_{it} is the collective which has been incorporated to account for the explanatory variables, β_j reflects the coefficient of individual independent variable, GDP_{dum} is the country fixed-effect dummy, δ_j represents the coefficient for the fixed-effect of the country created through a dummy variable, Y is the depiction of the fixed effect of time characterized by year and the term θ_j represents the coefficient for time fixed-effect dummy.

4 Results**Panel Unit Root Test**

Panel data has been used in the analysis, which is commonly susceptible to stationarity issues, thus a panel unit root test has been performed on the data. The panel unit root test is carried out to find the stationary properties and the order of integration of the variables. Variables which display 2nd order of integration can't be used for F , t and

chi-square tests (Im, Pesaran, & Shin, 2003). Moreover, the presence of unit roots increases the chances of presence of spurious regressions and misleading information from the results. Therefore, a panel unit root test is performed on the data. The null hypothesis of the test is that unit root is present and the alternate hypothesis states that unit root isn't present. The results of the analysis have been displayed in table. The results show that the variables MC, CC and EG are stationary at the level, whereas PC, BC and HC are non-stationary. However, at the first difference all six variables are stationary at the 5 percent level of significance (See Table 2).

Table 2: LLC unit root

Constructs	MC	HC	CC	BC	PC	EG
At Level	-2.394*	-1.399	-2.387*	-1.373	-1.394	-3.485**
1 st difference	-5.304**	-5.399**	-5.388**	-4.483**	-4.989**	-8.409**

Diagnostic Tests

The panel data has been observed to present econometric issues like heteroskedasticity, autocorrelation, multicollinearity and cross-sectional dependence. These problems need to be accounted for and reviewed before conducting the estimation so that the results do not suffer. The modified Wald and Breusch-Pagan/Cook Weisberg test is applied for heteroscedasticity, the Wooldridge test is performed for checking the autoregressive properties, VIF test and a correlation matrix is constructed for analyzing the correlations and multicollinearity, the cross-sectional dependence test developed by Pesaran (2004) is used for analyzing the cross-sectional dependence. The results obtained from the diagnostic tests are presented in table 3 and table 4 below. The results depict that both heteroskedasticity and cross-sectional dependence are present in the data, confirmed by the significance of both tests whereas the results of the Wooldridge test show that autocorrelation among the error terms wasn't found.

Table 3: Diagnostic checks

Heteroskedasticity	Autocorrelation	Cross-section dependence	Multicollinearity
Modified wald	Wooldridge	Pesaran	VIF
Breusch-Pagan/Cook-Weisberg			
χ^2 -value: 14.49**	F-statistic: 1.94	Test statistic: 4.883**	Mean VIF: 2.39
χ^2 -value: 8.39**			

For detecting the problem of multicollinearity; the data was analyzed by two measures, the VIF (variable inflating factor) and the correlation matrix. The VIF is a direct indicator of the presence or absence of the multicollinearity issue, a VIF less than 10 is an indication that the issue doesn't prevail. The correlation matrix is constructed in order to analyze the general relationships among the variables, correlations less than 0.8 are an indication that multicollinearity does not prevail. All the variables demonstrate moderate correlation i.e. values between 0.3 and 0.7 and the VIF factor is also less than 10 therefore confirming that multicollinearity doesn't exist among the variables.

Table 4: Correlation Matrix

Variables	MC	HC	CC	BC	PC	EG
MC	1					
HC	.374	1				
CC	.532	.477	1			
BC	.392	.484	.454	1		
PC	.483	.433	.399	.588	1	
EG	.294	.284	.389	.284	.494	1

PCSE Estimation

The data has presented the issues of cross-sectional dependence and heteroskedasticity, thus the empirical method of analysis applied to the regressors should be able to account for these issues. The PCSE estimation method has been employed in the study because the technique is adjusted to deal with the issue of panel data problems like such and mitigates the effect of these problems to produce vigorous results. The study uses the static and dynamic estimation method. The use of both methods is imperial for ensuring the robustness of the findings. The country fixed and time fixed effects have been used to adjust the unobserved heterogeneity. The PCSE estimation method has the assumption that the error disturbances are heteroskedastic and are correlated across the panels, thus the method has been modelled to cope with an unbalanced panel.

The results have been presented in table 5. According to the dynamic effect or the PCSE method the effects of mortgage credit and housing credit is insignificant. The effects of consumer credit, business credit and primary sector credit are positive and significant. A unitary change in consumer credit will initiate an increase of 21 percent in economic growth, a unitary change in business credit will be responsible for 28 percent shift in economic growth and 22 percent change will be produced due to change in primary sector credit. The static effects or the GMM estimation shows that only the effect of housing credit is insignificant whereas the mortgage credit, business, consumer and primary sector credit are all significant and positive. Thus the hypotheses are accepted for the significant relationships.

Table 5: Results from PCSE estimation

Dependent Variable = EG	PCSE estimation	Sys-GMM estimation
MC	0.0103 (0.736)	0.161** (0.488)
HC	0.043 (0.882)	0.100 (0.677)
CC	0.219** (0.309)	0.218** (0.499)
BC	0.282** (0.298)	0.384** (0.399)
PC	0.223** (0.477)	0.283** (0.385)
Constant	4.298** (0.264)	0.499** (0.399)
R^2	0.688*** (0.585)	-
<i>Arellano-Bond test for AR (1) (Pr W z)</i>	-	0.388
<i>Arellano-Bond test for AR (2) (Pr W z)</i>	-	0.299
<i>Hansen test of overid restrictions</i>	-	1.282

Discussion

Several studies focusing on the dimensions of credit and economic sustainability or other drivers of economic growth have been carried out (Cai, Song, Ma, Dong, & Xu, 2018). The effects of consumer credit, household credit, business credit, private sector credit and mortgage credit were focused in this study, the effects of household credit have been deemed inconclusive, which is in line with the previous studies. The relationship of extension of credit has been strongly linked with income level, which in the long run predicts economic sustainability and growth. In this regard Osman (2014) studied the effect of private sector credit on the economic growth in Saudi Arabia. The study uses an ARDL methodology to verify the effect of private sector credit and economic growth. The author was able to validate a positive long run relationship between private sector credit and economic growth, measured by GDP. The results of this study also depict positive relationship between PC and EC, showing that the private sector credit ability is an increasing factor for the economy, as the level of credit issued correlates with income level, the causal link between credit increase and economic growth can be

established. The study by Wood (2019) studied the effect of mortgage credit on the financial capacity of Denmark. The results intimate that increase in the mortgage payments is linked with the increase in the imports, and also has a significant effect on the BOP account (Exports-Imports), thus has substantial effects on the development of the GDP of a country. The study by Sipahutar (2018) contends on the idea that the availability of credit in the economy is viable for the effective monetary transmissions.

Conclusion

The primary aim of this study was to evaluate the effects dimensions of credit of the ASEAN countries on the economic sustainability of the country. For the purpose of this study the mortgage credit, business credit, consumer credit, household credit and private sector credit were considered to be the dimensions of credit. The data from 1995-2018 for the ASEAN countries has been analyzed. The relationship of the explanatory variables with the outcome variable was explored as they converge with the efficient and sustainable growth of economy and income levels in the long run. Several econometric tools and methods of assessment were applied on the data including the LLC unit root test, Wooldridge autocorrelation test, Wald and Breusch-Pagan/Cook Weisberg test of heteroskedasticity, VIF for multicollinearity and the Pesaran test for assessing the cross-sectional dependence of the panel. The PCSE estimation shows that the effects of household credit were insignificant whereas all other four dimensions were found to be significant and positive for economic growth.

Limitations and future recommendations

The study uses time series data, which is subject to problems like heteroskedasticity, autocorrelation, multicollinearity and cross-sectional dependence. Future researchers should consider taking cross-sectional data so that these issues can be avoided. The study only incorporates five dimensions of country credit, in order to correctly estimate the effects of credit on country's economic growth dimensions like bank credit and credit paying ability also needs to be included. The study has used a small dataset, it is advised to researchers that a larger dataset be used so that the historical effects of these indicators can also be studied.

Implications

The study has the important theoretical and academic implications. The study focuses on five distinct dimensions of credit and their effect on the economic sustainability in the ASEAN region. The studies focusing on credit affects in the ASEAN region are scarce, therefore the present study has important theoretical implications. Moreover, the policy makers can source the information from this study in the development of credit policies that align with the economic growth.

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