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Money Supply Influencing on Economic Growth Wide Phenomenon of AEC Open Region

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Abstract

This paper undertakes a thorough investigation into the intricate relationship between the money supply and economic growth within the ASEAN Economic Community region. This region spans across diverse countries such as Thailand, Indonesia, and Singapore, alongside several others, thereby providing a rich and varied landscape for this study's analysis. The research delves into an extensive examination of a wide array of secondary data pertaining to GDP growth rates and various components of the money supply, such as narrow money and demand deposits. These data sets are meticulously scrutinized over a robust nineteen-year timeframe, stretching from the year 1995 to 2025. To shed light on the dynamics at play, the study employs sophisticated panel unit root and panel ARDL models, utilizing the Pooled Mean Group Estimator to glean insights into both short-term fluctuations and long-term trends. As the findings unfold, it becomes apparent that certain key variables exhibit distinct characteristics; notably, narrow money and demand deposits emerge as stationary entities, contrasting with the non-stationary behavior observed in GDP growth rates. Crucially, the analysis uncovers a compelling pattern of a robust long-term correlation between the money supply and economic growth within the region, underscoring a noteworthy speed of adjustment towards achieving a sustainable long-term equilibrium.

Keyword: Money supply, Economic growth, Panel ARDL, Pooled Mean Group Estimator, Deposits and AEC.

1. Introduction

The problem of emerging ASEAN Economic Cooperation and the 'economic liberalizing tendency' discussed in modern articles by many scholars and such various economic subject matters as research practice, advanced computer technologies. Monetary policy is the manipulation of the money supply with the objective of affecting macroeconomic outcomes such as GDP growth, inflation, unemployment, and exchange rates.Monetary policy is conducted by the central bank of many countries.

So, the monetary policy is an important tool for maintaining economic stability and promoting economic growth as well. However, monetarists believe that an increase in the money supply will not affect to output or gross domestic product (GDP), but money supply will affect mainly on inflation. In past decade, the global financial crisis was observed. It was only found when the crisis, turned into a global economic recession that affected developed and developing countries. Even though, the economic in many developing countries consequences of these indirect effects were as severe as the direct effects were on developed countries. Nevertheless, the crisis has had various other impacts. The worldwide

recession led to a reduction of global GDP growth by -
0.35 percentage in 2009, which lower than was 4.85 percentage in 2007 and was 2.21 percent in 2008 respectively (International Monetary Fund (IMF), 2014). Even though, the global financial did not originate in ASEAN, and, indeed, the direct incapacitate to the financial sector in ASEAN has been much less than in other western regions. However, ASEAN economies have been hit hard by the sharp slowdown in demand in many developed economies and elsewhere. Some countries in ASEAN such as Singapore, Indonesia, Thailand, and Malaysia faced to large decline in exports. The result of crisis has influenced on the declined GDP growth of countries in ASEAN.
Especially, the GDP growth rate of Singapore, Thailand, and Malaysia have shown large decline. In 2009, the GDP growth rate in Thailand went down to -2.3 percentage, Malaysia -1.5 percentage, and Singapore -0.6 percentage, which lower than in 2007 were 5.0 percentage, 6.3 percentage and 9.1 percentage respectively. As a result, growth rate of the gross domestic product in ASEAN on year on year has dropped sharply from 6.7 percentage in 2007 to 1.8 percentage in 2009 (ASEAN Statistic, 2013). In order to resolve the issues and stimulate economic growth, the government of AEC countries passed an alternative policy in every way. One of the measures of government spending based on monetary policy to stimulate the economy have been adopted, together with fiscal policy. The central bank's monetary policy (expansionary money policy) to stimulate economic growth by lowering interest rates in order to increase the supply of money into the economy. Due to monetary policy plays as an important role in boosting the economic growth of many countries provided money as exogenously determined within the economy. So, changes in the quantitative money lead to change on aggregate demand sequence of AEC economic events of the number of sectors is still a very researchable subject, and for the third millennia there is the main arrangement modern. Our own academic dates represent an attempt to employ the economic research arrangement originally worked out. Therefore, to understand the role of monetary policy in the macroeconomics evens more. The research question of this study is to determine how the relationship between money supply and economic growth could be found. From the previous study there are a lot of studies examined the role of monetary policy on Gross Domestic Product (GDP) such as Oganmuyiwn C Ekone (2010), Zapodeamu C Cociuba (2010), Liang (2011), Ihan C Anjum (2013), and EI.seoud (2014). There are none of the previous study examined about the relationship between money supply and economic growth in context of AEC. Research results on the real benefits of an integrated AEC were provided as a way to ensure more reasonable economic development based on research useful information supporting public sectors and private sectors.

2. Objective of research

The objective of this study is to examine the relationship between money supply and economic growth of countries of selected AEC countries. In this study employed an empirical analysis based on panel ARDL approach by utilizing Pooled Mean Group
Estimator (PMG) to estimate the long run relationship between money supply and economic growth during the period of 1995 to 2013. The variables were used on this study including of economic growth and money supply, which consist of money supply (M1) and demand deposits (DD) of eight selected AEC countries, namely Thailand, Indonesia, Singapore, Malaysia, Philippines, Vietnam, Lao PDR, and Cambodia.

3. Literature reviews

Monetary policy is a significant role in boosting the economic growth of any country, although there has been a long debate in economics regarding the role of money in the economy. The Monetarists believe that monetary policy affects prices, but not real GDP or unemployment. The Keynesians, on the other hand, believe that changes in money supply

leads to changes in real output and prices. There are several researches related the role of money and economic growth, which has been investigated the relationship between these variables in the developed and developing countries. Bednarik (2010) employed Vector Autoregressive (VAR), Johansen Cointegration method, and Granger- Causality test to analysis the relationship between money supply (M3) and real GDP in the Czech Republic, by using quarterly data over period between 2002 to 2009, and conclude that whether the quantitative theory of money holds in Czech Republic, there is indeed strong and mutual relationship between money supply and real GDP.

Zapodeanu and Cociuba (2010) explored linking money supply with the gross domestic product in Romania by using the data of gross domestic product (GDP), and broad money (M3) and the monetary aggregates M1 and M2 during period of 1999 to 2010 were collected. Analyzing in Romania used the DVAR model for linking between the two sets of data types, used Co-integration analysis for testing two series to have a cointegration relationship between them. The result show that there is a cointegration between them, and found that The DVAR model is the best model for explicating the link between two variables. Ogunmuyiwa and Ekone (2010) investigated the impact of money supply and economic growth Nexus in Nigeria by using data during 1980 to 2006, and employed econometric technigue OLS estimator, Causality test and Error
Correction model to time series data. The results suggest that money supply do not have a significant predictive power in explaining the growth of real GDP on both of the choice between contractionary and expansionary money supply. Ihsan and Anjum (2013) has examined the impact of money supply (M2) on the GDP of Pakistan, due to high rate of inflation has adversely affected the economy of Pakistan which is a result of excessive supply of money (M2) by SPB. They have taken into consideration the data for 12 years from 2000 to 2011, and analyzed this data by using the regression model. In this model they have taken three independent variables that are inflation rate, interest rate and CPI and one dependent variable that is GDP. They found that the CPI and interest rate have a significant impact on GDP, and inflation rate has insignificant impact on GDP. Another aspect of the reviewed documentary was that there are examined the relationship between money, prices and real output in any country such as Abbas and Fazal (2006). Abbas and Fazal examined the relationship between money, prices and economic growth in Pakistan. Budina, Maliszewski, Menil and Turlea (2006) investigated the relationship between money, inflation and output in Romania. Shrestha (2010) studied about the impact of money supply on gross domestic product (GDP) and prices in Nepal. Ahmed and Suliman (2011) investigated the long run relationship between money supply, real GDP,an d price level in Sudan.

4. Research Methodology

This study is focused on the relationship between money supply and economic growth in eight ASEAN countries particularly Thailand, Indonesia, Singapore, Malaysia, Philippines, Vietnam, Lao PDR and Cambodia including three variables namely GDP growth rate (GGDP), money (M1) and demand deposits (DD) during the period from 1995 to 2013. In this research, the Pooled Mean Group estimator (MPG) was used to analyze long term and short term relationship between variables. The selected technique proposed by Pesaran et al. (1999). The Poole Mean Group estimator (MPG) combines both pooling and averaging. This estimator allows the intercepts, short-run coefficients and error variances to differ across the groups, but the long-run coefficients are constrained to be the same across groups. Meanwhile, this study is also examined by Mean Group estimator (MG) proposed by Pesaran and Smith (1995). The
Mean Group estimator allows the intercepts, slop coefficients and error variances to differ across the groups. The relationship between money supply and economic growth of selected in eight AEC countries which is being studied in this paper as shown on the following panel ARDL model equation(see more detail equation (1)).

$p1$ $q1$

$$' yit \text{ Ii } yi\,t, 1 \text{ E}icXit \text{ ¦O*}ij'yi\,t, j \text{ ¦J}ijc*'Xi\,t, j \text{ P H}i \quad it \quad (1)$$
$$j\,1 \qquad j\,0$$

where i 1,2,,N was represented the cross section data; t 1,2,,T was represented the time series data;
as GDP growth rate; as the money supply (is refer to money (M1) and demand deposits); as long term parameter; as a Speed of adjustment to long-term equilibrium. The first stage, in analyzing long term relationship between the variables in equation (1), involves establishing the order of integration using the panel unit root to check whether each panel data are integrated and has a unit root. In the other words, the null hypothesis was to test panel unit root test in order to know whether data are stationary or nonstationary. There are many types to test panel unit root, which in this paper used the test panel unit root based on the
Leivin, Lin, and Chu (LLC) test (2000); Im, Pesarn and Shin (IPS) test (2003); Breitung test (2000);
FisherType test (Maddal and Wu (1999) and Choi (2001)) using the ADF-Fisher and PP-Fisher. Second stage, considering that panel ARDL approach by Pooled Mean Group (PMG) and Mean Group (MG) to estimate the long run relationship between money supply and economic growth of selected in AEC
countries. According to PMG method, long term coefficient was the same for all units while intercept, speed of adjustment and short term coefficient are different between units. On the other hand, MG method, the coefficients of both the long term and the short term, intercept and speed of adjustment are different for every unit. In order to the availability of these two methods, Hausman test (Pesaran et al, 1999) is implemented to determine the selection model. The hypothesis in this paper is examined to
decide the appropriate of this long term coefficient with all units in the model. If this hypothesis is accept, the PMG is more appropriate as compared to MG.

5. Empirical Results

The result of investigation the relationship between money supply and economic growth of selected AEC countries can be expressed as following: Table 1 presents the result of panel unit root tests for the three variables in natural logarithms $\ln GGDP$, $\ln M1_{it}$, $\ln DD$ and by various methods, namely LLC test , IPS test, Breitung test, Fisher-Type test using the ADF-Fisher and PP-Fisher for both at the level and the first difference on individual effects and individual linear trends.

Table 1: Panel unit root test results of three variables in natural logarithms $\ln GGDP$, $\ln M1_{it}$, $\ln DD_{it}$ and by various methods

Variables	Panel Unit Root test					level
	LLC test	Breitung test	IPS test	ADF-Fisher test	PP-Fisher test	
$\ln GGDP_{it}$	-11.1779*** (0.0000)	-4.69013*** (0.0000)	-7.40224*** (0.0000)	66.9986*** (0.0000)	66.9437*** (0.0000)	Level I(0)
$\ln M1_{it}$	-8.82368*** (0.0000)	-7.18475*** (0.0000)	-6.27830*** (0.0000)	66.0547*** (0.0000)	75.4536*** (0.0000)	1st Differential or I(1)
$_{it}$	-7.89965*** (0.0000)	-6.47609*** (0.0000)	-5.55130*** (0.0000)	59.2687*** (0.0000)	74.2547*** (0.0000)	1st Differential or I(1)

Source: Calculated
Note: (1) Probability is shown in the parenthesis.
*(2) ***, **, * Significant levels at 1%, 5% and 10% respectively*

$\ln DD$

The result indicated that each of the variables were not the same integration level. GDP growth in natural logarithms data is stationary at level at 1 per cent level of significant, but money supply (M1) and demand deposits in natural logarithms data were stationary at first differential at 1percent level of significant, and therefore indicating that each of the variables have a different integration level at in order integration zero or I (0) and in order integration one or I(1). According to Table 2, the result showed that from both PMG and MG estimations. The PMG estimates suggested a positive relationship between money supply (M1) and GDP growth for selected ASEAN countries, but demand deposits was a negative with GDP growth in the long term. The long run coefficient of money supply (M1) and demand deposits were approximately
0.50 and 0.44 respectively, which was also significant at 1% level. The error correction term was significant with a value of negative 1.07. While, the MG estimates found that the long run coefficient of all variables were mostly insignificants.

Table 2: Results from Pooled Mean Group and Mean Group estimations for ASEAN

Dependent variable: ln*GGDPit*		
Explanatory Variables	Pooled Mean Group	Mean Group
	Long run coefficients	
ln*M*1*it*	0.5070*** (0.1575)	14.3381 (10.5535)
ln*DDit*	-0.4423*** (0.1622)	-14.6708 (10.6891)
	Short run coefficients	
'ln*M*1*it*	1.6102 (11.5077)	-10.2836* (6.0817)
'ln*DDit*	-2.0392 (12.2036)	10.5267* (6.3045)
Error Correction term	-1.0705*** (0.1530)	-1.1957*** (0.1436)
Constant term	0.1611 (0.1374)	8.7383 (4.6544)

Source: Calculated Note: (1) Standard errors are shown in the parenthesis.
*(2) ***, **, * Significant levels at 1%, 5% and 10% respectively*

Table 3: The results of short run coefficient by individual countries such as Thailand, Indonesia, Singapore, Malaysia, Philippines, Vietnam, Laos, and Cambodia

Variables	Countries							
	Thailand	Indonesia	Singapore	Malaysia	Philippines	Vietnam	Laos	Cambodia
$'\ln M1_{it}$	76.2707 (58.5007)	-4.5060*** (1.0902)	-3.2219 (12.3839)	-33.0990 (26.4058)	-22.0829*** (7.6428)	1.7374** (0.8445)	-2.2555*** (0.6018)	0.0385 (1.3346)
$'\ln DDit$	-81.4537 (61.8719)	5.3413*** (1.2144)	1.5393 (14.0350)	32.8308 (27.2477)	24.8812*** (8.1707)	-1.6487* (0.8837)	2.7649*** (0.7266)	-0.5690 (2.4699)
EC	-1.1831*** (0.2563)	-0.9735*** (0.0632)	-0.6463 (0.4034)	-1.3999*** (0.3416)	-1.1621*** (0.1912)	-0.4460*** (0.1739)	-1.8319*** (0.2006)	-0.9209*** (0.2392)
Constrains	0.0586 (0.6249)	-0.1039 (0.2791)	0.2058 (0.3450)	0.0629 (0.6173)	-0.3560 (0.3397)	0.0841 (0.1441)	0.9654 (0.4051)	0.3716 (0.4965)

Source: Calculated

Note: (1) Standard errors are shown in the parenthesis.

*(2) ***, **, * Significant levels at 1%, 5% and 10% respectively*

Based on Table 3, error correction term indicated that there were significantly relationships for the seven AEC countries, except for Singapore; the error correction term was insignificant. In short run, showed that the money supply (M1) and demand deposits variables were significant toward GDP growth in Indonesia, Philippines, Vietnam and Laos. Which, money supply (M1) variable was a negative relationship on GDP growth in Indonesia, Philippines and Laos, but demand deposits variable was positive in these countries. For Vietnam, money supply (M1) was positive relationship on GDP growth, but demand deposits is negative. Therefore, this study can be explained that the increase in money supply (M1) maybe cannot impact on increase in short run economic growth for Indonesia, Philippines and Laos.

Table 4: Hausman Test result

Variables	Coefficients		(b-B)	Sqrt (diag		
	(b) mg	(B) pmg	Difference	(V_b-V_B)) S.E.	Chi-sqare F2	Prob>F2
ln*M*1*it*	14.33807	0.5069764	13.83109	14.20401	2.10	0.3491
ln*CDit*	-14.67078	-0.4422471	-14.22853	14.38639		

Note: *(1) b = consistent under H0 and H a ; B = inconsistent under H a , efficient under H*0

H

(2) Test: 0 *difference in coefficients no systematic*

Form Table 4, the results showed that with the Hausman test to select the most appropriate model to estimate the relationship between money supply and economic growth of selected countries in ASEAN.

This study

found that The Hausman statistic is 2.10 and is distributed Chi-sqare (2). Therefore, conclude that the efficient estimator under the null hypothesis, the Pooled Mean Group Estimator is the most appropriate model.

6. Conclusion

This paper investigated the relationship between money supply and economic growth of selected in AEC countries during the period of 1995 to 2013 by using Pooled Mean Group estimator under panel ARDL model. The findings from this study showed that there is a long run relationship between money supply and economic growth. Money supply (M1) was a positive correction with GDP growth, while demand deposits were a negative correction on GDP growth. In addition, the Hausman test was used for selection the best method between Pooled Mean Group and Mean Group estimators.

The results suggested that Pooled Mean Group estimator was the most appropriate method to investigate the relationship between money supply and economic growth of selected AEC countries.

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Finding And Suggestion

The money supply refers to the total amount of money circulating in an economy at a given time. It's a crucial concept in macroeconomics, influencing economic activity, inflation and interest rates [1].

Measures of Money Supply

The money supply is categorized into four main types:

- *M1 (Narrow Money)*: Includes physical currency, demand deposits and liquid assets. - *M2 (Broad Money)*: Encompasses M1 plus savings deposits, time deposits and money market mutual funds.
- *M3*: Includes M2 plus large time deposits, institutional money market funds and larger liquid assets. - *M4*: The broadest measure, including M3 plus all other deposits.

Factors Affecting Money Supply

Several factors influence the money supply:

- *Central Bank Actions*: Adjusting interest rates and reserve requirements.
- *Commercial Bank Lending*: Creating money through lending practices.
- *Public Preferences*: Holding currency versus deposits.
- *Economic Activity*: Velocity of money circulation. - *Government Spending*: Fiscal policies impacting money supply [2].

Controlling Money Supply

Central banks control the money supply through:

- *Open Market Operations*: Buying or selling securities.
- *Interest Rate Adjustments*: Influencing borrowing costs. - *Reserve Requirements*: Regulating commercial bank reserves [3].

Importance of Money Supply

Understanding the money supply is vital for:

- *Monetary Policy*: Informing central bank decisions.
- *Economic Growth*: Influencing inflation and employment. - *Financial Stability*: Maintaining a stable financial system [4].

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