The Influence of Macroeconomics and Social Variables on Economic Growth: A study of ASEAN Countries

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This research aims at discovering the influence of macroeconomic and social variables on economic growth in 5 ASEAN countries. It uses time series data from 1986 to 2015. The approach used is an Error Correction Model (ECM). The research results indicate that gross fixed capital formation (GFCF) has a positive and consistent influence for both long and short runs for the five ASEAN countries. Inflation has a negative influence in Indonesia, yet it has positive effect on other countries. The Rupiah exchange rate has had a negative influence in all ASEAN countries. The total trading value has negative influence in most ASEAN countries, yet it has positive influence in Singapore. The value of Indonesia's disequilibrium coefficient ECt is the lowest, thus, the adjustment of the actual value to its equilibrium is done faster than other countries.

Keywords: *Economic growth, Gross Fixed Capital Formation, Exchange Rate, Inflation, ECM.*

Introduction

Economic growth constitutes one of indicators of a country's economic development. Despite its limitations and weaknesses, insofar economic growth still becomes a highly important calculation. This is because 1) economic growth does not always reduce poverty, yet with no economic growth it will be extremely hard to reduce poverty, 2) economic growth is always measured with output increase and when the output increases it is expected that it will open more job opportunities, hence, using its economic growth a country is expected to be able to reduce its unemployment, 3) the economic recession occuring in many countries has led to a significant increase in their budget deficits, thus, economic growth becomes an

important alternative to deal with government's budget deficit, 4) economic growth enables an increase to resources for public services such as education and health, hence it allows an increase to social expense without a tax rate increase.

However, the concept of economic growth is still debatable. This cannot be separated from the fact that the economic growth in ASEAN is vulnerable to global effect. Since the 2008 economic crisis, a global crisis has occured and it also affected a number of ASEAN countries. These countries made some adjustments and even re-corrected their economic growth target to be achieved in the following year. Extremely hard work is needed to restore a country's economic stability. Below is a comparison of economic growths in ASEAN.

Table 1: Economic Growths In Asean

Country	1998-1999 Asia Crisis	2000-2007 Growth and stabil	2008-2009 Global crisis	2010	2011	2012	2013	2014
Brunei	1.25	2.24	-1.85	2.6	2.2	1.6	-1.8	-3.3
Kamboja	8.5	9.93	3.4	6.1	7.1	7.2	7.3	7.2
Indonesia	-6.15	5.04	5.3	6.2	6.5	6.2	5.78	5.21
Laos	4.25	6.75	7.65	8.1	8	8.1	7.9	7.6
Malaysia	-0.65	5.5	1.65	7.1	5.1	5.6	6.8	6.2
Myanmar	8.35	12.88	4.35	5.3	5.4	6.3	6.7	6.5
Filipina	1.25	4.88	2.65	7.6	3.9	6.5	7.2	5.7
Singapur	2.05	6.36	0.5	14.8	5.1	1.2	3.7	4.9
Thailand	-3.05	5.05	0.1	7.8	-0.1	6.4	2.9	-2.1
Vietnam	5.3	7.64	5.8	6.8	5.9	5	5.42	4.96
ASEAN	**-1.9**	**5.56**	**3.85**	**8.3**	**4.9**	**5.2**	**5.1**	**4.3**

The avarage of economic growth 1998-1999, 2000-2007 and 2008-2009
Sources: IMF, CEIC 2014

Regarding the economic growth of 1998-1999 in ASEAN countries, almost all countries experienced negative economic growth. The country with the lowest economic growth was Indonesia (grew -6.15%) and the highest economic growth being Cambodia and Myanmar (8.5% and 8.35%). During the growth stability era, Indonesia's economy is below the ASEAN average economic growth, i.e. below 5.56 percent. Meanwhile, Myanmar has the highest economic growth at 12.88 percent and Brunei Darussalam has the lowest economic growth at 2.4 percent.

The global crisis occuring in the United States also affects the economic condition of the ASEAN region. The countries affected by this global crisis are Brunei Darussalam (growing

only -1.85 percent), Singapore (0.5 percent), and Thailand (0.1 percent). Furthermore, ASEAN's economic growth is merely 3.85 percent. This indicates that ASEAN countries are still vulnerable to the global crisis.

In the face of global uncertainty in ASEAN, a shift of economic growth pattern is currently happening, where the nature of this growth in Asia becomes more balanced, inclusive, and long-lasting. The pattern may take the forms of large-scale investment in infrastructure, consumptions driven by middle-class society, and reform in social policy becomes a machine to increase growth in the ASEAN region.

This research aims at discovering the influence of macroeconomic and social variables on economic growth in 5 ASEAN countries. This research uses time series data from 1986-2015.

Theoretical Bases

Many theories explain about the concept of economic growth. These theories can generally be divided into three schools of thoughts, namely, classic, neoclassic, and modern (structural). The classic economic theory suggests that four factors influence economic growth. These factors are the number of population, natural wealth, technology level, and economic openness. Malthus (DATE) emphasises that a human grows faster than the growth of any renewable natural resources. This triggers a gap between humans and the production factors used. Many studies have used population variable such as Sylwester (2000), Rustam (2013) and Gisore (2014). All of whom find that the population has a positive influence on economic growth. Meanwhile, David Ricardo (DATE) states that in developing countries, a large part of their natural resources have not been optimally used, hence population growth accelerates economic activities. However, at some point population growth may erode economic growth.

ASEAN countries follow an open economic system. Any country with an open economic system is always involved in international goods and services trading and investment. These two components of international trading and investment are a measurement to calculate national income in addition to government consumption and expenditure. Economists agree that in developing countries, in order to cut of poverty circle, investment or capital establishment is needed. Syachfuddina (2020) explains that the components in a state's development are: gross domestic product (GDP), population development coupled with manpower development and their skills, and technology advancement.

The need for investment in developing countries is thought to be urgent, be it foreign or domestic investments, since it gives positive effect on economic growth. Mehana (2011) and Husen (2011) in their empirical studies found that investment can encourage economic growth and improve the specialisation of an industry due to the application of the technology they use.

The empirical study conducted by Velnampy and Achchuthan (2013) found that an increase in trading will improve economic growth. Taking international trading variable into consideration, ASEAN countries in 2015 agree that they will establish an ASEAN Economic Community (AEC) to facilitate the flow of goods and services between countries in ASEAN. Furthermore, the application of technology in ASEAN countries will drive the efficiency of production factors to allow the industries in ASEAN countries to compete with those in industrial and developed countries.

The view of Kaldor (DATE) from neoclassic school of thought on long-term growth process is directed to sectoral growth which includes the sector of primary and secondary commodity productions (industry and construction). Meanwhile, those activities in tertiary sector (services) are deemed by Kaldor as the function of industrial development.

One of the starting points of the very existence of macroeconomics is the presence of short-term economic issues which cannot be dealt with classic economic theories. These short-term economic issues are inflation, unemployment, and balance of payment. The depression which occurred in the United States in 1929 was a disaster occurring in their economy where production activities were ceased as a result of the high inflation and equally high unemployment rate at the same time.

Inflation is a symptom which indicates a continuous raise in prices in general. All countries in the world keep on facing this inflation issue, thus the inflation rate occuring in a country constitutes one point to measure whether or not the economic issues dealt with by this country are good. Inflation is said to be low when it ranges between 2 and 4 percents, and high if it ranges between 7 and 10 percents. However, the 1997-1998 crisis had caused some ASEAN countries to slump and experience hyper inflation, i.e. an extremely high inflation which causes a crisis.

The empirical study conducted by Kasini and Mwakanemela (2013) reveals that inflation has negative influence on economic growth. When inflation increases, it will decrease the economic growth rate. This indicates that the occuring inflation does not accelerate the

economic growth and it is a high one for it decreases the economic growth rate. In developing countries, inflation can occur due to the high demand (*demand side inflation*) and the cost push (*cost-pushed inflation*).

The cost-pushed inflation may occur due to exchange rate depreciation. The Organisation for Economic Co-operation and Development (OECD) suggests that global uncertainty may affect a country's domestic economic condition. This global uncertainty can be measured by the exchange rate, thus, the exchange rate will be fluctuate more and continue to depreciate when there is a shock from global influence. A currency's exchange rate is influenced by many factors depending on the system the country is following and a currency's exchange rate fluctuation will affect the economy. The appreciation of domestic currency against a foreign one may lead to an increasing demand from the community for goods and services. When over demand occurs, it can result in a high inflation. When a depreciation of domestic currency against foreign one occurs, it may lead people to keep on hunting the foreign currency.

Basirat and Mehdi (2014) in their empirical study suggest that in developing countries, the exchange rate has a negative influence on economic growth. This cannot be separated from the vulnerability of exchange rates in developing countries to global influence. If the exchange rate is continuously depreciated, the domestic currency will weaken against foreign currency, leading to the increase in prices of goods in the country and the decrease in people's purchasing power. Moreover, these two will eventually give negative impact on economic growth.

Based on the explanation regarding the hypothesis of correlation between macroeconomic variables and economic growth needs clarification. Previous studies fail to give a specific explanation due to the varied state development circumstances and phenomena. Therefore, a more intensive observation is needed regarding the correlation of chosen macroeconomic variables and social variables and economic growth in five ASEAN countries.

Method

The data used here are secondary, obtained from the World Bank. This study uses time series data from 1986 to 2015 in 5 ASEAN countries. The countries used in this studyare: Indonesia, Malaysia, Singapore, Thailand, and the Philippines. Time series data are a set of observations on the values of a variable from several different periods of time. Time series data should first fulfill the basic assumption of stationarity. The variables used in this research are Gross Domestic Product (GDP), Inflation (INF), Lending Interest Rate (LIR),

Exchange Rate (Kurs), Gross Fixed Capital Formation (GFCF), Industry Value Added (IVA), total trading value (Trade), number of population (POP) and income from tax (TR). The analysis tool used here is the Error Correction Model (ECM) approach. The stages in ECM are stationarity test, cointegration test and ECM analysis.

Stationarity Test

Time series data are said to be stationary if the values of mean, variance, and autocovariance at various lag times are constant at any point of time when measurement is made. Nonstationary time series data are usually called as time series data which have changing means as time goes (time varying mean) or changing variances as time goes (time varying variance) or both. If the time series data are nonstationary, the behaviour is limited only to a specific period of time. Thus, it is impossible to generalise this behaviour for other periods of time. The data stationarity test uses *Dickey Fuller* test, starting from a first-order autoregression process for each variable at *level* grade. If the result shows that the data are stationary, it can then proceed to the next test. However, if the data are found nonstationary at the first estimation, the data then should be changed into their differential form. Below is the basic form of stationarity test.

Dickey Fuller (DF)

$$\Delta Y_t = \delta Y_{t-1} + \varepsilon_t \qquad\qquad 1)$$
$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \varepsilon_t \qquad\qquad 2)$$
$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \varepsilon_t \qquad\qquad 3)$$

Augmented Dickey Fuller (ADF)

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + \varepsilon_t \qquad\qquad 4)$$
$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + \varepsilon_t \qquad\qquad 5)$$
$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + \varepsilon_t \qquad\qquad 6)$$

The best DF and ADF test models are the models which have the minimum *Akaike information criterion* (AIC) values. If the coefficient $\delta > 0$ $\delta > 0$ (positive), then the DF and ADF tests are invalid for the time series data being tested have explosive nature (Gujarati, 2010). The DF and ADF test hypotheses are: $H_0: \delta = 0 H_0: \delta = 0$ (data nonstationary) and $H_A: \delta < 0 H_A: \delta < 0$ (data stationary). If prob.t > alpha significance level, then the *null hypothesis* is confirmed.

Cointegration Test

Cointegration occurs only between nonstationary variables. Cointegration occurs when the combination between nonstationary variables negates each others cause of nonstationarity of each variable. Economically, two or more variables cointegrate when these variables have a long-term relationship or equilibrium. If $\varepsilon_t \varepsilon_t$ is stationary, then it means $Y_t Y_t$ and $X_t X_t$ cointegrate. Below is the basic form of cointegration model.

Engle-Granger

$$\Delta\varepsilon_t = \delta\varepsilon_{t-1} + \varepsilon_t \Delta\varepsilon_t = \delta\varepsilon_{t-1} + \varepsilon_t \qquad\qquad 7)$$

Augmented Engle-Granger

$$\Delta\varepsilon_t = \delta\varepsilon_{t-1} + \sum_{i=1}^{k}\alpha_i\Delta\varepsilon_{t-1} + \varepsilon_t \Delta\varepsilon_t = \delta\varepsilon_{t-1} + \sum_{i=1}^{k}\alpha_i\Delta\varepsilon_{t-1} + \varepsilon_t \qquad 8)$$

The hypotheses of cointegration test are: $H_0: \delta = 0 H_0: \delta = 0$ (not cointegrate) and $H_A: \delta < 0$ $H_A: \delta < 0$ (cointegrate). If t-*trace statistic < t-McKinnon*, then the *null hypothesis* is confirmed, meaning they do not cointegrate.

Error Correction Model (ECM) Analysis

The time series data is often nonstationary, resulting in doubtful regression or commonly called as spurious regression. Spurious regression is a situation where the regression result shows statistically significant regression coefficient and high determination coefficient value, yet the variables in the model do not relate to each other. To deal with this matter, the ECM model can be applied provided that the variables used are stationary at *first difference* and cointegration exists. The existences of cointegration between variables indicate that there is long-term correlation or equilibrium in the variables in the model. In short , it is possible for disequilibrium to exist. This disequilibrium is frequently found in economic behaviour. It means what is wanted by economic actors does not necessarily the same with the existing reality. This difference between economic actors and what is happening requires some adjusment. The model which includes adjustment to correct the equilibrium is called as *error correction model* (ECM). In general, ECM model can be written as follows:

$$\Delta Y_t = \alpha_0 + \alpha_1\Delta X_t + \alpha_2 EC_t + e_t \; \Delta Y_t = \alpha_0 + \alpha_1\Delta X_t + \alpha_2 EC_t + e_t \qquad 9)$$

When the disequilibrium error coefficient $EC_t EC_t$ is statistically significant, it means the specification of ECM model used is valid. The different data availability among the countries demands an adjustment to the ECM formula to be used.

ECM Model for Indonesia

$$\Delta lnGDP_t = \alpha_0 + \alpha_1 \Delta lnGFCF_t + \alpha_2 \Delta lnIVA_t + \alpha_3 \Delta lnKurs_t + \alpha_4 \Delta INF_t + \alpha_5 \Delta lnPOP_t + \alpha_6 \Delta lnTrade_t + \alpha_7 EC_t + e_t$$
$$\Delta lnGDP_t = \alpha_0 + \alpha_1 \Delta lnGFCF_t + \alpha_2 \Delta lnIVA_t + \alpha_3 \Delta lnKurs_t + \alpha_4 \Delta INF_t + \alpha_5 \Delta lnPOP_t + \alpha_6 \Delta lnTrade_t + \alpha_7 EC_t + e_t$$

10)

ECM Model for Malaysia

$$\Delta lnGDP_t = \alpha_0 + \alpha_1 \Delta lnGFCF_t + \alpha_2 \Delta lnIVA_t + \alpha_3 \Delta lnKurs_t + \alpha_4 \Delta LIR_t + \alpha_5 \Delta lnPOP_t + \alpha_6 \Delta lnTrade_t + \alpha_7 EC_t + e_t$$
$$\Delta lnGDP_t = \alpha_0 + \alpha_1 \Delta lnGFCF_t + \alpha_2 \Delta lnIVA_t + \alpha_3 \Delta lnKurs_t + \alpha_4 \Delta LIR_t + \alpha_5 \Delta lnPOP_t + \alpha_6 \Delta lnTrade_t + \alpha_7 EC_t + e_t$$

11)

ECM Model for Singapore

$$\Delta lnGDP_t = \alpha_0 + \alpha_1 \Delta lnGFCF_t + \alpha_2 \Delta lnIVA_t + \alpha_3 \Delta lnKurs_t + \alpha_4 \Delta INF_t + \alpha_5 \Delta lnAK_t + \alpha_6 \Delta lnTrade_t + \alpha_7 EC_t + e_t$$
$$\Delta lnGDP_t = \alpha_0 + \alpha_1 \Delta lnGFCF_t + \alpha_2 \Delta lnIVA_t + \alpha_3 \Delta lnKurs_t + \alpha_4 \Delta INF_t + \alpha_5 \Delta lnAK_t + \alpha_6 \Delta lnTrade_t + \alpha_7 EC_t + e_t$$

12)

ECM Model for Thailand

$$\Delta lnGDP_t = \alpha_0 + \alpha_1 \Delta lnGFCF_t + \alpha_2 \Delta lnTR_t + \alpha_3 \Delta lnIVA_t + \alpha_4 \Delta INF_t + \alpha_5 \Delta lnAK_t + \alpha_6 \Delta lnTrade_t + \alpha_7 EC_t + e_t$$
$$\Delta lnGDP_t = \alpha_0 + \alpha_1 \Delta lnGFCF_t + \alpha_2 \Delta lnTR_t + \alpha_3 \Delta lnIVA_t + \alpha_4 \Delta INF_t + \alpha_5 \Delta lnAK_t + \alpha_6 \Delta lnTrade_t + \alpha_7 EC_t + e_t$$

13)

ECM Model for Philippines

$$\Delta lnGDP_t = \alpha_0 + \alpha_1 \Delta lnGFCF_t + \alpha_2 \Delta lnIVA_t + \alpha_3 \Delta lnKurs_t + \alpha_4 \Delta INF_t + \alpha_5 \Delta lnPOP_t + \alpha_6 \Delta lnTrade_t + \alpha_7 EC_t + e_t$$
$$\Delta lnGDP_t = \alpha_0 + \alpha_1 \Delta lnGFCF_t + \alpha_2 \Delta lnIVA_t + \alpha_3 \Delta lnKurs_t + \alpha_4 \Delta INF_t + \alpha_5 \Delta lnPOP_t + \alpha_6 \Delta lnTrade_t + \alpha_7 EC_t + e_t$$

12)

Where GDP is *gross domestic product* as the dependent variable. The independent variables consist of *gross fixed capital formation* (annotated as GFCF) as the *proxy* of investment,

industry value added (IVA), exchange rate (as Kurs), number of population (POP), workforce (AK), total income from tax (TR), total trading value (Trade), *lending interest rate* (LIR) and inflation (INF). The hypotheses $H_0: \sum_{j=1}^{m} \delta_i = 0 H_0: \sum_{j=1}^{m} \delta_i = 0$; and $H_A: \sum_{j=1}^{m} \delta_i \neq 0$ $H_A: \sum_{j=1}^{m} \delta_i \neq 0$ are tested. The test method is that if prob.F statistic > alpha significance level, then the *null hypothesis* is confirmed.

Discussion

ECM method applies *adjusment* in the model. It is used when there is a difference between what economic actors expect and what is happening. The initial step in ECM method is detecting all variables used in the stationarity test. Table 2 shows the stationarity tests using two methods, i.e. Augmented Dickey Fuller (ADF) and Philips Perron (PP) methods. This serves as a comparison in the stationarity tests which use and not use *lag*.

Table 2: Stationarity Test

Group Unit Root Test	Model	□ stat	Prob. □	Cross-sections	Obs	
	Level					
Indonesia	ADF-Fisher Chi-square	16.7449	0.6695	10	283	
	PP-Fisher Chi-Square	16.5726	0.6805	10	290	
	First Difference					
	ADF-Fisher Chi-square	128.973	0.0000***	10	270	
	PP-Fisher Chi-Square	173.417	0.0000***	10	270	
	Level					
Malaysia	ADF-Fisher Chi-square	14.5562	0.8012	10	286	
	PP-Fisher Chi-Square	14.4639	0.8062	10	290	
	First Difference					
	ADF-Fisher Chi-square	144.696	0.0000***	10	277	
	PP-Fisher Chi-Square	180.192	0.0000***	10	280	
	Level					

Singapur	ADF-Fisher Chi-square	19.2643	0.5047	10	286
	PP-Fisher Chi-Square	16.6272	0.5770	10	290
	First Difference				
	ADF-Fisher Chi-square	123.381	0.0000***	10	279
	PP-Fisher Chi-Square	147.114	0.0000***	10	280
	Level				
Thailand	ADF-Fisher Chi-square	15.1169	0.5161	8	223
	PP-Fisher Chi-Square	12.5186	0.7076	8	232
	First Difference				
	ADF-Fisher Chi-square	114.830	0.0000***	8	220
	PP-Fisher Chi-Square	153.149	0.0000***	8	224
	Level				
Filipina	ADF-Fisher Chi-square	5.30569	0.9996	10	273
	PP-Fisher Chi-Square	9.83803	0.9710	10	290
	First Difference				
	ADF-Fisher Chi-square	114.830	0.0000***	8	220
	PP-Fisher Chi-Square	153.149	0.0000***	8	224

Note: *** Significance 1%; ** Significance 5% dan * Significance 10%;
Sources: Output Eviews8

The stationarity test in this model uses the *group unit root test* because each country has their own model. The stationary models are those with probability values below the alpha value. The stationarity test of each model in a country does not pass at level stage. This allows to use stationarity test at *first difference*. The result of stationarity test at *first difference* using both ADF test and PP test models indicate that all countries using *group unit root test* are stationary at *first difference*. After performing the stationarity test, the next step is incorporating the formula of each country to the ECM model.

The long-term estimation in ECM models uses the *Ordinary Least Square* (OLS) model. This is used to test the classic assumption issue as in Table 3. From the result of classic assumption test in long-term estimation shows that the OLS model for each country passes the autocorrelation and heteroscedasticity issues for the probability value is greater than alpha 5%. The normality issue for Malaysia model is that it has value below alpha 5%, yet the number of observations is more than 30, thus it can be followed to ECM model.

Table 3: The long term estimation

Dependent Variable Log(GDP)	Indonesia	Malaysia	Singapura	Thailand	Filipina
Log(GFCF)	0.251955	0.137510	0.075064	-0.011364	-0.097707
	5.288830***	8.0339***	1.469867	-0.682552	-3.8747***
Log(TR)				0.271613	
				8.5951***	
Log(IVA)	0.261582	0.340785	0.369346	0.356812	1.009362
	4.273431***	6.6880***	2.88500**	7.3441***	20,592***
Log(Kurs)	-0.04319	-0.050806	-0.142614		0.058858
	-1.622629	-1.5243	-2.09417*		2.269**
INF	0.001138		-0.008533	-0.006501	-0.000146
	2.738478**		2.81329**	-5.0733***	-0.177385
LIR		0.004146			
		1.743086*			
Log(POP)	2.042082	1.320282			
	7.812045***	52.385***			
Log(AK)			0.376437	0.101905	0.357640
			3.4734***	0.754708	3.586***
Log(Trade)	-0.0876	-0.060491	0.324850	0.035218	-0.090686
	-2.276226**	-2.3701**	5.6346***	1.133586	-3.944***
C	-17.6296	-6.369341	0.774675	9.324004	-1.152498
	-4.735283	-9.7119	1.461969	4.208	-1.152498
Adj R Square	0.99	0,999	0.998	0.99	0.998
	Prob (F Version)				
F Stat	5300.789	23243.93	3347.113	8045.978	2950.706
Serial Correlation	0.060168	0.4411	0.1061	0.1763	0.410
Heteroskedasticity	0.104673	0.8637	0.8019	0.8466	0.4295
	Jarque-bera				
Normality	0.351388	0.005	0.434	0.767	0.2047

Note: *** Significance   1%;   ** Significance 5%   dan * Significance   10%;
Sources: Output Eviews8

The next step is the ECM model estimation. The ECM model will apply *adjusment* to the model. The use of *time series* data gives an emphasis on the stationarity in the data. The step in ECM also applies stationarity test. After learning that all data of each country are stationary at *first difference*, Table 4 will then present estimations of ECM model or short-term estimation for each country.

Table 4: The result of shortterm estimation

Dependen Variabel D(Log(GDP))	Indonesia	Malaysia	Singapura	Thailand	Filipina
D(Log(GFCF))	0,243845	0,13447	0,124135	0,04665	0,031158
	8,65911***	4,9344***	2,2297**	2,3572**	-1,97054
D(Log(TR))				0,097263	
				2,3418**	
D(Log(IVA))	0,168495	0,292442	0,435681	0,438913	0,661851
	3,2782***	4,4302***	5,5251***	10,250***	9,8690***
D(Log(Kurs))	-0,03244	-0,054605	-0,035435		-0,044775
	-1,572754	-1,238656	-0,446557		-2,4394***
D(INF)	0,000362		0,000610	-0,002237	0,000418
	1,473819		0,237489	-2,3600**	1,068815
D(LIR)		-0,000210			
		-0,069694			
D(Log(POP))	2,449302	1,206446			
	2,845783**	8,8695***			
D(Log(AK))			-0,352138	-0,033196	-0,014933
			-1,544019	-0,297513	-0,136119
D(Log(Trade))	-0,06494	-0,007096	0,108417	0,028180	-0,036869
	-3,02138***	-0,141819	1,703346	1,354723	1,830178
ECT(-1)	-0,36847	-0,874828	-0,391186	-0,591435	-0,385551
	-2,283683**	-3,1414***	-2,1610**	-2,8004**	-3,1315***
C	-0,00241	0,002715	0,032401	0,011146	0,020568
	-0,204613	0,377535	4,0522	3,4050	4,9783
Adj R Square	0,86	0,96	0,87	0,98	0,90
	Prob (F Version)				
F Stat	109,44***	91,44***	26,77***	169,995***	35,73***
Serial Correlation	0,810971	0,1344	0,3828	0,8118	0,974
Heteroskedasticity	0,2528	0,881	0,1982	0,9736	0,7388
	Jarque-bera				
Normality	0,933498	0,000	0,688	0,7905	0,7923

Note: *** Significance 1%; ** Significance 5% dan * Significance 10%;
Sources: Output Eviews8

Tables 3 and 4 are the results of long-term and short-term estimations in ECM model. Based on the tables above, it can be seen that the *gross fixed capital formation* (GFCF) variable has positive influence in both long and short runs on economic growth. This indicates that the addition of physical assets from investment strengthens economic growth in ASEAN. However, in Thailand, the GFCF variable only has influence in short run since the addition of assets is centered at major cities, thus in the long run most population in Thailand cannot really benefit from it and this country focuses more on agriculture and plantation sectors.

From 1980 until recently, ASEAN countries had been continuing to perform industrialisation processes to all sectors. This industrialisation is performed because of the issue of large number of the population in ASEAN countries, forcing the governments through their policies to create as many job opportunities as possible. Prabatmodjo and Micklin (1991) in their empirical study which focuses on industrialisation and urbanisation issues suggest that the industrialisation policy would create job opportunities and in the end it will increase people's income and encourage economic growth. Not too different from what has been stated by Prabatmodjo, the result of estimation in the long and short runs is consistent in 5 ASEAN countries, i.e. that the value added of industry has positive influence on economic growth and it shows that the industries in ASEAN countries are competitive. Other than Singapore and Philippines, ASEAN countries have enormous natural resources. This allows them to make industrilisation policy to those sectors they can export so that the natural resources they use can strengthen the economic growth in ASEAN.

The main macroeconomic issue in the short run is inflation. At certain points, it can worsen a country's economy. The result of estimation in a long run shows that in Thailand and Singapore indicates that an increase in inflation reduces the economic growth in both countries. The inflation in these two countries indicates a fairly high level that it reduces their economic growths, consistent with the study previously conducted by Kasini and Mwakanemela (2013). However, unlike what happens in Indonesia, their inflation has positive influence on economic growth. This indicates that the inflation rate in Indonesia is quite moderate and can accelerate economic growth.

After the 2008 crisis, the world has been in the face of economic uncertainty until recently. This will eventually influence the exchange rate of each country. Since most ASEAN countries are developing ones, it will significantly affect their exchange rate. The result of short-term estimation indicates that when the exchange rate is depreciated against the Dollar

exchange rate, it will reduce economic growth. Yet, the long-term estimation shows a consistent result with that of the short-term, except for the Philippines. This is because the Philippines has no direct relationship with the United States in both their trade and politics. This finding is consistent with Basirat and Mehdi (2014) who state that in developing countries the exchange rate value has negative influence on economic growth.

The abundant amount of natural and human resources in ASEAN countries can be their strengths when they can be optimally utilised. The estimation for short and long runs indicate a consistent result in Indonesia and Malaysia, i.e. the number of population has positive influence on economic growth, thus the increase in number of population will increase economic growth. In Singapore, Thailand, and the Philippines it is found that the increase in workforce will strengthen their economic growth in a long run. This result shows that the workforces in these 3 countries are productive.

The natural resources differences of each country lead them to build a trading agreement. They do this to fulfill the domestic needs they cannot produce or they can produce themselves at high costs. The estimation result in a long run indicates that in Indonesia, Malaysia and the Philippines trading value has negative influence. The increase in trading value in these 3 countries is dominated by import, rather than its export. Therefore, an increase in their total trading will reduce their economic growth. This is different from what happens in Singapore. The total trading value of Singapore has positive influence on economic growth, since their export value is greater than the import and Singapore is a developed country.

The disequilibrium value (ECT-1) is statistically significant for these 5 ASEAN countries. This means the ECM models used in this research are valid. Every country has varied coefficient EC_t values. The result on EC_t values indicates a difference between actual and equilibrium values. Indonesia's coefficient EC_t value of = -0.3685, Malaysia's coefficient EC_t = -0.8748, Singapore's coefficient EC_t = -0.3912, Thailand's coefficient EC_t = -0.5914, and the Philippines's coefficient EC_t = -0.3856. From these results, it can be seen that the lowest EC_t value is Indonesia at -0.3685, which means that the difference between their GDP actual value and equilibrium value is 0.3685 and this will be adjusted for 3 years. Meanwhile, Singapore's EC_t value is -0.8748, meaning that the adjustment between their GDP actual value and equilibrium values is made for 8 years and this becomes the longest one as compared to other ASEAN countries in this research.

Conclusion

From the discussion above, some conclusions can be drawn. *Firstly,* the turmoil in macroeconomic variables will affect the economic growth in 5 ASEAN countries. This can be seen from the fact that the exchange rate has a negative impact on economies in ASEAN. *Secondly,* the composition of GDP in ASEAN countries which still depends on consumption level becomes more vulnerable to domestic economic condition, particularly in inflation variable, expect Singapore which is a developed country and Indonesia whose inflation value is still moderate and even accelerates their economic growth. *Thirdly,* the social variables such as number of population and workforce level indicate positive results, where in the growth of population strengthen the economic growth and the increase in workforce level in Singapore, Thailand and the Philippines also strengthen their economic growth. This indicates that the workforce in the 3 countries are fairly productive. *Fourthly,* the industries in these 5 ASEAN countries are competitive with the industries at global level since the increase in value in these industries can encourage economic growth in ASEAN. *Fifthly,* it is important to use an investment fund to add domestic assets since the addition of assets from investment can support the economic growth in ASEAN and it shows that ASEAN is the best place for investment. *Sixthly*, Indonesia's ECt value is the lowest, hence their adjustment is shorter than other countries and the longest one to adjust their GDP actual value to its equilibrium is Singapore since their ECt value is quite high.

Considering the economic conditions in ASEAN countries which is fairly vulnerable to global impact, the governments in ASEAN countries should then apply the import substitution policy to reduce imported goods of secondary nature. Furthermore, these governments should be able to maintain their interest rate caused by the fluctuation of exchange rate, allowing their domestic economic condition to be more stable. While they cannot avoid the global influence, the governments of ASEAN countries can do something to deal with it, which involves keeping their economic condition stable by keeping their inflation level low, creating a conducive economic climate for both foreign and domestic investors to invest in and revitalising assets to allow the economy to grow.

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