

Determinants of Export Performance in ASEAN Region: Panel Data Analysis

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Abstract

International trade is one of the major aspects that grow tremendously in Southeast Asia and export is regarded as main accelerators of growth in either developed or developing countries. The objective of this study is to determine the determinants of export performance for ASEAN countries. In this study, panel Autoregressive Distributed Lag (ARDL) method is adopted for time period between 2000 to 2015. Empirical findings indicate that there is a long-run relationship between determinants of export such as interest rate, economic growth and foreign direct investment with export performance of ASEAN countries. Therefore, policy makers need to strategize their policies to move towards closer cooperation among the ASEAN countries, especially promoting sustainable exportation in the region.

Keywords: export performance, panel data, pooled mean group

JEL Classification: E31, E35, F31

1. Introduction

One of the objectives of all society is economic development and also the elementary to economic development is economic process. Export is thought to be one in every of the most accelerators of growth in either developed or developing countries. The export activities have undergone tremendous development within the geographical area region and become one in every of the engines of growth. Association of Southeast Asian Nations (ASEAN) was established in 1967 by Indonesia, Malaysia, the Philippines, Singapore and Brunei Darussalam (1984), Vietnam (1995), Laos and Myanmar (1997, Cambodia (1999). The ASEAN is “the strongest and prosperous regional association within the developing world” (Hirsch 1976). ASEAN Economy lays the region within the world in terms of human resource, economic process, trade and investments. Association of Southeast Asian Nations economy gazes into key macroeconomics developments among the region. The Association of Southeast Asian Nations lessons the trends of trade goods of exports and imports, arrangement and direction of trade among the region and with world.

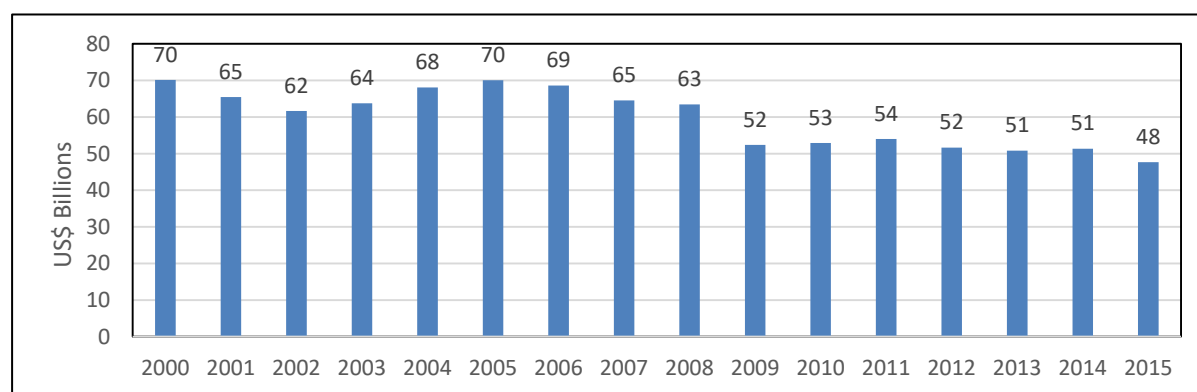
Table 1. ASEAN Economy in 2000 and 2015

Country	Area (km ²)	Pop 2015 (000 persons)	GDP growth rate (%)		GDP 2000 and 2015 (Current price US\$)		GDP per capita in 2000 and 2015 (US\$)		Export Value in 2000 and 2015 (US\$ Millions)	
			2000	and 2015	2000	and 2015	2000	and 2015	2000	and 2015
Singapore	719	5,535	8.89	8.89	137,804	291,938	23793	58,888	137,804	350,506
Brunei	5765	417	2.8	2.8	3903	12909	18155	30555	3902	11960
Cambodia	181,035	15,405	8.7	8.7	1389	18,463	299.5	1,159	1,389	11,960
Lao PDR	236,800	6,902	5.7	5.7	330	12,639	324	1,818	330	2,340
Philippine	300,000	101,562	4.3	4.3	39,783	289,503	1,040	2,904	39,783	58,647
Vietnam	330,951	917,713	6.7	6.7	14483	193,407	433	2,111	14,483	162,106
Malaysia	330,290	30,485	8.9	8.9	98,229	294,390	4004.5	9,768	98,229	199,869
Thailand	513,120	68,979	4.5	4.5	69057	395,726	2016	5,814	69,057	214,375
Myanmar	676,577	52,476	13.7	13.7	1646	65,392	186.8	1161	1,646	5,950
Indonesia	1,913,578	255,462	3.6	3.6	65403	857,603	780	3,347	65,403	1,502,824
Total	4,488,839	628,937	6.7	6.7	428,124	2,431,969	5103	11,752.50	432,026	2,575,177

Source: WDI, 2016 and ASEAN Macroeconomic Database

According to the Table (1), Indonesia's population is 240 million and it indicated 1st ranked in ASEAN region. The term "ASEAN countries as the last frontier in Asia," mainly status abundant and cheap labours supply. ASEAN GDP at current price US\$ Millions 2,431,969 is 5.6 time increased in 2015 than from US\$ Millions 428,124 in 2000. The ASEAN' GDP per capita had already increased 2.3 time in 2015 than 2000. Also, ASEAN export value is six times increased from in 2000 than 2015. In 2015, ASEAN's inhabitants increased by 11.1% from 2007. After China and India, ASEAN's population was the third largest in the world. 40% of the region's total population was Indonesia's population (ASEAN Statistics 2016). After China and Japan, ASEAN was third among the countries in Asia. ASEAN Trade in Services shows the trends of exports and imports of services within ASEAN and with the rest of the world. Because total trade of ASEAN stood at US\$2.3 trillion, gross domestic product at current price for 3.3% of the world's total trade in 2015; and placed fourth after China (15.0%), USA (24.5%) and Germany (8.0%).

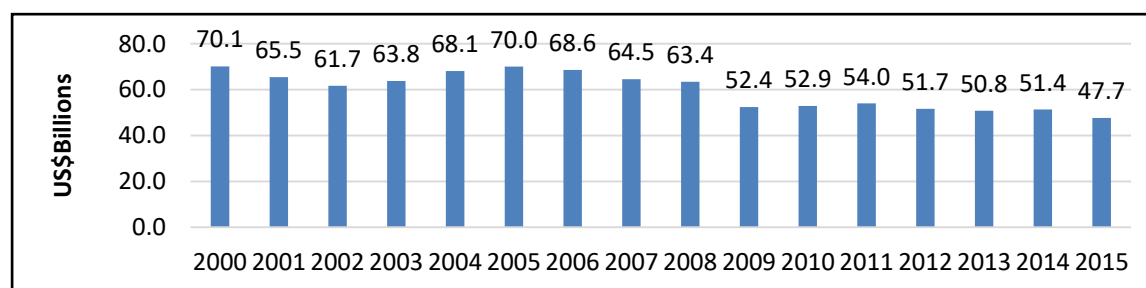
Figure 1 shows the ASEAN export value percentage of gross domestic product in 2015. The overall structure of ASEAN economies has transformed in 2007 by decreasing significance of export value and the share of the export value in the economy gradually decreasing to reach 48% in 2015 respectively.



Source: Calculation by UN-Comrade (2016) Data

Figure 1. ASEAN Export (% of Normal GDP)

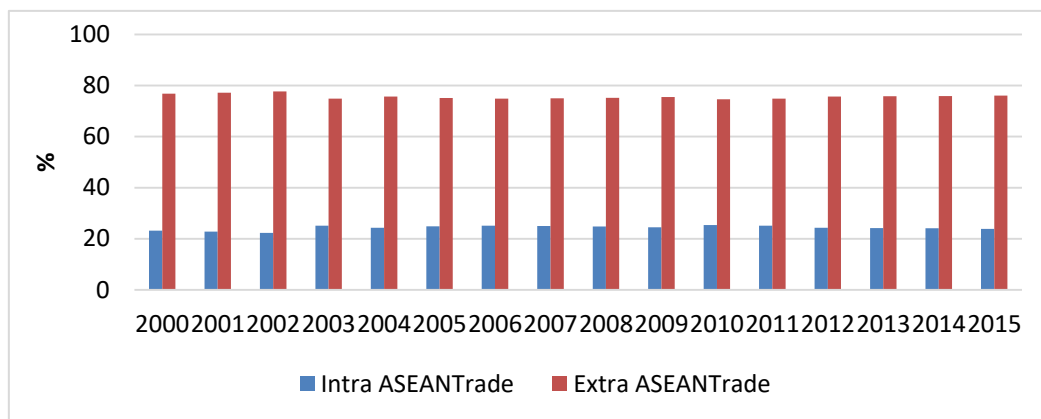
ASEAN economy practiced quick economic growth in the past 15 years. ASEAN's GDP has increased 5.6 times in 16 years from 2000 to 2015. The strong performance of the merchandise trade sector has also been a resilient driver for the region's output enlargement. The ASEAN's total trade quantitative relation of nominal output remains vital, though lower over recent years once the 2008 global financial crisis, reaching forty-seven percent in 2015 (Figure 2).



Source: Calculation by UN-Comrade (2016) Data

Figure 2. ASEAN's Total Trade (% of Normal GDP)

According to the figure, the percentage of normal gross domestic product of ASEAN is strong showing of the trade sector that making deeper economic relations at intervals the region and with the worldwide economy, has assisted ASEAN well through reinforcing the region's external account position. The numerous positive excesses of the merchandise trade supply associate degree offset to the change services deficit, keeping ASEAN's balance in surplus in from 2009 to 2011. It is worth emphasizing that service of ASEAN exports are growing quicker over recent years, leading to a narrowing of the change services deficit. By 2015, the magnitude relation of ASEAN's balance to its nominal output stood at regarding negative result 10.1%. Given the weak performance of the products change recent years, the term of trade surplus magnitude relation has been narrowing.



Source: Calculation by UN-Comtrade (2016) Data

Figure 3. ASEAN Total Trade (Intra and Extra ASEAN Trade, ASEAN6 and CLMV)

According to the Figure 4, Year-on-year growth in intra-regional trade changed considerably from 2000 to 2015, largely reflecting the vacillating adjustments and rough recovery among many economies after the 2008 financial crisis. During 2000 to 2015, extra ASEAN trade is important place than intra ASEAN trade. ASEAN 6 trade was same important in ASEAN total trade while CLMV is trade low than ASEAN6 total trade. Export performance is important for the developing and developed countries' economic development. ASEAN is a different region in terms of element endowments, technical skills, human investment development and output. Its variety is revealed in different export forms across member countries. Indonesia, Malaysia, Singapore, Thailand, Philippines and Brunei (ASEAN 6) are large exporters of manufacture and service products, Myanmar, Cambodia, Lao and Viet Nam (CLMV) are major exporters of agricultural products and some are manufactured products. After global financial crisis, ASEAN experienced 0.2%, -10.1% and -2.9% in 2008, 2012 and 2013 in term of trade that ASEAN facing in risk in export performance especially export and import sector. According to the ASEAN trade pattern, the ASEAN-6 economies have experienced a remarkable increase in both amount and volume of extra total trade more than intra-regional trade flows since the last three decades. CLMV have experienced decrease in both extra and intra total trade from 2000 to 2015. Therefore, ASEAN total trade growth depend on ASEAN-6 countries export performance. The export performance in ASEAN is the key element of sustainable growth in the long-run. According to the facts, ASEAN-6 countries more developed than CLMV countries. To address these challenges, ASEAN countries' government need to control a trade strategy (export policy, GDP and FDI) and monetary policy (interest rate, inflation and exchange rate) including their export business, local transformations to facilitate economic restructuring and relief, and initiatives to deepen and widen provincial integration, resulting in better productivity and value reductions through economies of scale and network externalities.

2. Literature Review

There are many empirical studies on developing countries that studied the relationship between export and economic growth reported the existence of a positive relationship between export and economic growth, and empirical proof in support of the export-led growth hypothesis (Levin, 1997).

Fisher (1993) defined that inflation was a cause of reduction in growth which resulted from decline in investment and output growth. Kormendi & Meguire (1985), Nell (2000) and Geofry (2013) found that inflation and economic growth or export performance are positively significant. The estimated results show that inflation has an adverse impact on growth. Maintaining a stable exchange rate is necessary condition for sustained growth and that countries that avoided overvaluation sustained economic growth and substantial export diversification. The rate of exchange may be a crucial variable in decisive export growth, diversification and international fight of products made during a country. Sharma (2001), Harris (2000), Hossain (2002), Baldwin (1979), Biggs, (2007), Mishkin, (2008), Babatunde (2009), Anagaw & Demissie (2011), Obansa (2013) found a positive significant connection between real exchange rate and export performance. But, some studies show that the effect of exchange rate on export is negative. The interest rates, an element in the relative price movements that drive the exchange rate, is found to affect significantly the export performance of good performers, due to the in climbing producer charges and that is impacting negatively on export competitiveness. Gagnon, and Ihrig, (2004), Berg and Miao (2010) found interest rate is statistically insignificant to export performance. The determinants of export growth in developing countries are significant and it is sure that GDP has the significant progressive

impact on volume of exports according to Kumar (2014). Helleiner (1973) found that export may be a part of GDP we tend to might expect a high coefficient of correlation between export and GDP. The correlation between GDP growth and growth of exports is bigger among the high-income countries. Apparently, the correlation between GDP growth and growth of export is greater in the 1990s than the 1970s for all income groups. Allaro (2012) studied that positive relationship between real growth of export and RGDP of the exports performance of oilseeds and its determinants in Ethiopia for the period of 2000-2011.

Previous studies on the determinants of export performance in developing countries display that Foreign Direct Investment features an important positive impact on export structure. Michiel Van Dijk (2002) steered a same study in Indonesia and initiate out that FDI was very significant in explaining their export performance. Amelia and Santos (2000) described that effect of trade liberalization in selected 48 developing countries showed that FDI significantly impacts on export volumes. Studies on export performance in developing countries show that FDI has a significant positive impact on export structure; Amelia and Santos (2000) revealed that FDI sometimes chooses sectors in the economy that may not have comparatively specialized that affects export performance. Also, the study suggested that imports of intermediate inputs it are important determinants of changes in the export structure. In recent years, there has been a special interest in the link between export performance and (GDP), term of trade, exchange rates, inflation, FDI, and interest rates in both advanced and developing countries. On the other hand, empirical literature shows widely and net justifications for complementary relationship between exports value and interest rate, inflation, exchange rate, gross domestic product and foreign direct investment (FDI) through different types of works which switching or diverging theoretical results. So far all reviewed empirical studies agree that GDP were both found to have a positive influence to export performance whereas inflation rate had a negative result.

3. Methodology

In this study, the data are obtained from ASEAN Economic bulletin, International Monetary Fund (IMF) and World Bank from the year 2000 to 2015 of ASEAN. This study is a mixture of time-series and cross-sectional data. Macro panel data analysis is applied where periods of years (sixteen year) is greater than numbers of observations (ten countries). This inquiry is endeavors to explore the association among export performance and its determinants. Prior researches, estimating the export performance (Mallampally & Sauvart, (1999); Giles and Williams (2000); Fugazza, (2004); Grenier. et al., (2005); Jongwanich, (2007); Jorgen and Michel. (2008); Babatunde, (2009); Anagaw, and Demissie, (2012) showed there are six factors that could affect the export performance determinants, such as Inflation rate (INF), interest rate(INST), Real Exchange Rate(EXR), Gross Domestic Product (GDP) and Foreign Direct Investment (FDI). The basic model of this research is given as below.

Thus, Export Performance is a function of the following variables:

$$EXP = f(INF, EXR, INST, GDP, FDI) \dots \dots \dots (1)$$

$$EXP_{it} = \beta_0 + \beta_1 INF_{it} + \beta_2 EXR_{it} + \beta_3 INST_{it} + \beta_4 GDP_{it} + \beta_5 FDI_{it} + \mu_{it} \dots \dots \dots (2)$$

Macro Panel Data analysis include unit roots test, co-integration test and pooled mean groups and means group (PMG & MG) estimator for evaluate to thesis results.

Panel Unit Root Test

Panel unit root test is the method to test the variables used in the model whether they are stationary or not by using the different tests. The Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS), and Fisher-Type test are applied in a different way of tests.

Panel Cointegration Test

Panel co integration test is the method to test the variables used in the model whether the co integrated combination among the variables in a panel model, the residuals of the panel estimation need to be stationary. Pedroni (1999) introduced seven test statistics for panel co integration test and derived the approximate critical values for these statistics. Among seven statistics, the four statistics are created on the within dimension statistics. Pedroni (1999) refers to the within dimension and between dimension-based statistics as group mean panel co integration statistics.

Panel Autoregressive Distributed Lag

The autoregressive distributed lag (ARDL) model deals with single cointegration and is introduced originally by Pesaran and Shin (1999) and further extended by Pesaran et al. (2001). In this research paper, panel ARDL regression model will be applied considering the problem of large number of estimations. ARDL can test for cointegration and forecast long-run and short-run dynamics while the variables are mixture of $I(0)$ and $I(1)$.

Assume that we have data on a number of time periods $t = 1, \dots, T$ and a number of groups $i = 1, \dots, N_1$ and then ARDL model is defined as followed,

$$y_{it} = \sum_{i=1}^p \lambda_{ij} y_{i,t-j} + \sum_{i=0}^q \delta'_{ij} X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (3)$$

The repressors of $x_{i,t}$ vary over both time periods and groups. As the ARDL approach is appropriate by higher amount of observations, that we can estimation the model for individual group (Pesaran, Shin et al. 1998).

Pooled Mean Group (PMG) Estimator

PMG is an estimator, which covers both pooling and averaging. The estimator allows the intercepts, short-run coefficients and error variances to differ freely across groups, but the long-run coefficients are constrained to be the same. Thus, the good reason to predict the long-run equilibrium relationships between variables to be similar across groups. It is the maximum likelihood (ML) that forecasts the long-run coefficient and the group specific error-correction coefficients, can be calculated by maximizing the following equation with respect to γ .

$$\ell_T(\gamma) = -\frac{T}{2} \sum_{i=1}^N \ln 2\pi\sigma_i^2 - \frac{1}{2} \sum_{i=1}^N \frac{1}{\sigma_i^2} (\Delta y_i - \phi_i \xi_i(\theta))' H_i (\Delta y_i - \phi_i \xi_i(\theta)) \quad (4)$$

Where, $H_i = I_T - W_i(W_i'W_i)^{-1}W_i'$, I_T refers to an identity matrix of order T, and $\gamma = (\theta', \phi', \sigma')'$.

The above equation is under t PMG estimator lets in us to inspect the frequent long-run coefficient except making the less achievable assumption of identical dynamics in man or woman interest and also approves inspecting long-run similarity without imposing parameter homogeneity in the short-run. The defaulting outcomes of PMG choice encompass the long-run parameter reviews and the averaged short-run parameter estimations.

While the panel data analysis has individual rewards in investigative the effect of export performance determinates (INF, INST, EXR, GDP and FDI) on export performance (export value), the longer time dimension of panel knowledge might cause the matter of non-stationary, and specious regression. Baltagi (2001) notes that for a macro-panel with massive N (numbers of countries) and an extended T (length of time series) non-stationary deserves additional attention. Therefore, so as to verify the existence of long-term stable relationship between export performance determinates and exports, each testing for unit roots at intervals the panel and assessing co integration square measure necessary before estimating the model. In recent years, a variety of procedures for testing the unit roots and co integration, pool mean group and mean group (PMG, MG) method with strata and e-view software and it has the advantages long-run coefficients in panel statistics situation have been settled and attainment improved recognition in observed investigation.

Table 2. Summary of Operational Variables

Variables	Abbreviation	Variable definition/Formula	Sign
Export Performance	EXP	EXP = log (Export Value-US\$)	
Inflation	INF	INF= log (Inflation)	(-)
Exchange Rate	EXR	EXR= log (Exchange Rate)	(-)
Interest Rate	INST	INST= log (Interest Rate)	(-)
GDP	GDP	GDP= log (C+I+S+G)	(+)
FDI	FDI	og (Foreign Direct Investment)	(+)

Export Value (EXP)

Export value is mainly depending on international trade or World demand. World demand is considered to be an important determinant in the export function that affects export performance from the demand side. To measure world demand various variables have been used across studies. Following Roy (1991) and Attri & Sahni (2012), the present study has used total world imports as a proxy for world demand. Although the theory assumes that

there may be positive or negative impact of world income of the country's exports.

Inflation (INF)

Inflation is greatest defined as rise in price as whole, where inflation decreases purchasing power from a currency. Inflation has a little indicators such as Consumer Price Index (CPI), Wholesale Price Index (WPI), and Implicit Price Index (deflator GDP) (Majeed Tempo, 2006).

Interest Rate (INST)

On the supply side, export performance also depends on relative prices including bank interest rate. Easterly (1993) suggest that INST is one of the reasons representing economic development of a Country, Interest rate can measure by a percentage of money time a bank deposit a year.

Normal Exchange Rate (EXR)

The studies which have explored the relationship between NER and export performance found mixed results. The demand for exports is very sensitive to real exchange rate movements. Dhasmana (2013) noted that exchange rate overvaluation results in currency appreciation which adversely affects the export performance whereas depreciation proves beneficial. Rijesh (2010) suggested that depreciation makes exports cheaper in the world market which results in increase in demand for exports. Supporting Jones & Kierzkowski (2001) and Jongwanich (2010) posit that depreciation will lower foreign currency prices of exports but on the other hand if exports imported goods intensive then it will raise home currency prices of import components. Thus, EXR may have positive or negative impact on export performance.

Production Level or Gross Domestic Product (GDP)

Production level or gross domestic product is a crucial supply side determinant of exports. The higher level of production generates surplus output which can be traded in overseas markets to earn foreign exchange. Thus the gross domestic product is final goods and services at competitive cost are a key determinant of export performance of a country.

Foreign Direct Investment (FDI)

FDI is another supply side determinant expected to affect export performance (Anas, 2011). The contribution of FDI in export-oriented industries may improve export performance. Some studies such as Zhang (2008), Johnsen (2007), Jongwanich (2010), Anas (2011) find positive effects of FDI on exports whereas others like Sharma (2000 & 2003), Majeed and Ahmad (2006), Sahoo, Dash and Mishra (2015) find insignificant, weak or negative impact. Hence, the contribution of FDI towards export performance has remained controversial.

3. Empirical Findings

The analysis of the relationship between the export performance determinants and their export performance is depicted in Table 3. Initially, the analysis of stationary and long-run equilibrium are examined using unit root and co-integration test. Secondly, pool mean group and mean group (PMG, MG) method with strata and e-view software and it has the advantages long-run coefficients to be identical, but the intercepts, short-term ASEAN export performance, there is a long-run coefficient across ASEAN countries.

Table 3. Panel Unit Root Test Results (ASEAN)

Test Method	Individual Intercept					
	Levin, Lin and Chu		Im, Pesaran and Shin W-stat		PP - Fisher Chi-square	
	Level	1 st Difference	Level	1 st Difference	Level	1 st Difference
EX	-1.2376 (0.107)	-8.0479*** (0.000)	1.5211 (0.935)	-6.6262*** (0.000)	8.8325 (0.9848)	89.3494*** (0.000)
INF	-6.9041*** (0.000)	-15.9615*** (0.000)	-5.0342*** (0.000)	-12.9144*** (0.000)	68.6947*** (0.000)	203.680*** (0.000)
INEST	-11.3482*** (0.000)	-6.9038*** (0.000)	-5.7559*** (0.000)	-8.9889*** (0.000)	65.3729*** (0.000)	131.754*** (0.000)
EXR	-2.2836** (0.0112)	-4.7761*** (0.000)	-1.5073* (0.0659)	-3.7750*** (0.000)	28.6545* (0.0948)	48.1372*** (0.0004)
GDP	-1.0283 (0.1519)	-5.6448*** (0.000)	2.6808 (0.9963)	-4.7233*** (0.000)	5.2882 (0.9996)	55.0377*** (0.000)
FDI	3.3034 (0.998)	-6.3776*** (0.000)	3.5678 (0.9998)	-7.5207*** (0.000)	15.3553 (0.7557)	134.918*** (0.000)
Individual Intercept and Trend						
EX	2.3243 (0.989)	-9.0728*** (0.000)	1.9266 (0.9730)	-5.0899*** (0.000)	14.1088 (0.8249)	106.088*** (0.000)

INF	-12.3658*** (0.000)	-7.77168*** (0.000)	-9.6380*** (0.000)	-4.40409*** (0.000)	64.1482*** (0.000)	181.262*** (0.000)
INEST	-13.9162*** (0.000)	-5.8971*** (0.000)	-7.7152*** (0.000)	-8.1725*** (0.000)	64.6974*** (0.000)	140.381*** (0.000)
EXR	-0.3857 (0.3450)	-5.0908*** (0.000)	0.3589 (0.6402)	-1.5412** (0.0606)	20.6164 (0.4200)	32.532** (0.0379)
GDP	3.5736 (0.999)	-7.9769*** (0.000)	2.8116 (0.9975)	-3.1064*** (0.0002)	8.6420 (0.9867)	45.4152*** (0.0010)
FDI	0.7949 (0.7867)	-6.2053*** (0.000)	-1.0250 (0.1527)	-7.1329*** (0.000)	44.5696** (0.0013)	105.136*** (0.000)
None						
EX	7.9280 (1.000)	-7.2780*** (0.000)	...	..	0.9231 (1.000)	86.8139*** (0.000)
INF	-2.9332*** (0.001)	-17.3541*** (0.000)	...	..	36.1345** (0.0148)	227.840*** (0.000)
INEST	-3.2107*** (0.000)	-12.9606*** (0.000)	..	...	51.5981*** (0.000)	169.968*** (0.000)
EXR	1.3027 (0.9036)	-7.7614*** (0.000)	..	...	13.8763 (0.8367)	86.5578*** (0.000)
GDP	14.8678 (1.000)	-4.1705 (0.000)***	..	..	0.1896 (1.000)	46.6027*** (0.0007)
FDI	2.2278 (0.9871)	-9.3117*** (0.000)	...	....	4.16633 (0.999)	158.021*** (0.000)

Notes. Null hypothesis; panel data has unit root (Non-stationary); p -value is larger than 5%.

Alternative hypothesis; panel data has not unit root (stationary); p -value is lower than 5%.

Values in the brackets are p -values.

The different kind of techniques of unit root tests are applied by Levin, Lin and Chu (LLC) (2002), Im, Pesaran and Shin (IPS) (2003), and Fisher-Type to this empirical research. The different unit root tests of results show that we can reject the null-hypothesis for two variables inflation and interest rate (INF and INEST) since p -values are lower than 5 percent level. Accepting the alternative hypothesis for these variables, it means that they do not have unit root and all the results of above authors Chi-square considerably indicate that they are stationary at the extent. If the p -values which is higher than 5 percent that we have to accept null hypothesis and so we can see (determinants) figures set contains unit root at the level. Therefore, we need to take the first difference to the D(EX), D(EXRATE), D(FDI) and D(GDP) according to the results shown in Table 3, the EX, EXR, FDI and GDP became stationary after taking first difference. Moreover, even we test unit root using different methods for our data sets, all the results answer in the same way. For the next step, next author; Pedroni Residual Co integration test will be examined the panel co integration between variables.

Panel Cointegration Tests

The residuals of the panel estimation need to be stationary in order to establish a co-integrated combination among the variables in the panel model since all the variables are integrated of order one. In this chapter, three group mean panel co-integration statistics - developed by Pedroni (1999) and panel co-integration test statistics - three panel co-integration statistics are used to test for a long-run relationship among the variables.

In the Table 4, the results are presented. All of the considered figures recommend that the null of no-co integration is excluded for all approximations. Thus, there is a strong evidence that support the existence of a long-run relationship among the variables (export performance in ASEAN: export value and export performance determinants such as INF, INEST, EXR, GDP and FDI) of the study.

Table 4. Panel Cointegration Tests Results (Pedroni Residual Co integration Test)

Deterministic Intercept and Trend			
Null Hypothesis:		Weighted Statistics	Prob
Panel v-Statistic	Within-	-3.0988	0.9990
Panel rho-Statistic	dimensio	4.4585	1.0000
Panel PP-Statistic	n	-8.244***	0.0000
Panel ADF-Statistic		-5.950***	0.0000
Group rho-Statistic	Between		
Group PP-Statistic	-dimensio		
Group ADF-Statistic	n		
No Deterministic Trend			
Panel v-Statistic	Within-	-2.3711	0.9911
Panel rho-Statistic	dimensio	3.5874	0.9998
Panel PP-Statistic	n	-4.521***	0.0000
Panel ADF-Statistic		-5.704***	0.0000
Group rho-Statistic	Between	.....	.....
Group PP-Statistic	-dimensio	.....	.....
Group ADF-Statistic	n	.....	.....
Kao Residual Co integration Test			
No Deterministic Trend			
ADF		Statistics	Prob
		-3.7756***	0.0001

Notes. Null hypothesis; panel data has No-co integration; p-value is larger than 5%. Alt hypothesis; panel data has co integration; p-value is lower than 5%. Values in the brackets are p-values.

PMG and MG Test (ASEAN)

The panel economic science methodology is argued this section. To evaluate factors for active various panel data, there are 2 two main approaches. Firstly, the individual coefficient (Blackburne and Frank, 2007) and also the Mean group (MG) method presented by Pesaran and Smith (1995) that depends on estimating N statistic regressions. The opposite approach is that the pooled mean cluster (PMG) methodology presented by Pesaran et al. (1999). The co-integration sort of the autoregressive distributed lag (ARDL) model and adapts it for a panel setting are from the pooled mean group (PMG) model. The co-integration form of the autoregressive distributed lag (ARDL) model and adapts it for a panel setting are from the pooled mean group (PMG) model. This method has the benefits over the MG method by allowing the long-run coefficients to be identical, but the intercepts, short-ASEAN trade and investment, there is a good to believe in common long-run coefficient across Association of Southeast Asian Nations countries.

Table 5. PMG and MG Panel Co-integration Test (ASEAN)

PMG				MG		Hausman Test
Long –Run (Dependent Variable: EX)						
	Coef.	Std Err.	p-value	Coef.	Std Err.	p-value
EXR	0.1086***	0.0418	0.009	2.5818	2.8903	0.372
FDI	1.1239***	0.1727	0.000	4.2926	3.0170	0.155
GDP	0.9899***	0.0258	0.000	1.7560**	0.7764	0.024
INEST	-0.0005	0.0025	0.853	0.04613	0.0429	0.283
INF	0.0039***	0.0006	0.000	0.0228	0.0246	0.354
Short –Run (Dependent Variable: EX)						
EXR	0.8196	0.9080	0.367	0.7099	0.90435	0.432
FDI	-0.3455	1.0348	0.738	0.5720	0.7591	0.451
GDP	1.541	0.7945	0.052	1.3883	0.7437	0.806
INEST	-0.00645	0.0036	0.077	-0.0018	0.0075	0.806
INF	0.0025	0.0025	0.317	0.00661	0.0025	0.009
Prob >chi2 = 0.9694 (PMG> efficient)						

Prob >chi2
= 0.9694
(PMG> efficient)

The asterisks ***, ** and * denote the significance level at 1, 5 percent and 10 percent respectively

According to the table, PMG estimation results, the long-run and short-run coefficients determined the relationship between explanatory variables and dependent variables are shown in Table 5 at the panel level. The inflation has positive impact on export with significant level that the coefficient shows when a 1% increase of inflation will increase the export with the value of 0.0039%. EXR has positive impact on export performance that the coefficient shows when a 1% increase of exchange rate will increase the export with the value of 0.1087% significant test statistic. The GDP has positive impact on export that the coefficient shows when a 1% increase of

GDP will increase the export with the value of 0.9899% significant test statistic. The FDI has positive impact on export that the coefficient shows when a 1% increase of FDI will increase the export with the value of 1.1239% significant test statistic. The significant value of probability with respond to interest rate is greater than 10% level. Therefore, we can conclude whether these variables have significant positive relationship to export in the long-run. On the other hand, among the four variables (INF, EXR, GDP and FDI) are positive relationships to export in the long run estimation. Assessing the replace Mean Group (MG) for the long-run of panel level, the results are significant at 1% level is described in Table 5. Among the determinants of export, only inflation has positive influence on export in the long-run estimation, while the results for the other determinants are statistically insignificant.

Table 6. Pooled Mean Group (PMG) of Individual Cross Section Estimation

Countries	Independent Variable				
	INF	INEST	EXR	GDP	FDI
Myanmar	0.00467*** (0.0000)	-0.0271*** (0.0000)	-2.4517*** (0.0000)	-1.7682*** (0.0000)	2.0867*** (0.000)
Thailand	0.01101*** (0.000)	0.0049* (0.069)	-0.1933 (0.675)	0.8343** (0.023)	-0.0790 (0.220)
Cambodia	0.0032** (0.013)	-0.0124 (0.289)	-2.0735 (0.109)	-0.1212 (0.838)	-8.6803 (0.590)
Vietnam	0.0011 (0.667)	-0.0018 (0.644)	1.5207** (0.003)	1.2100*** (0.000)	0.2026 (0.211)
Laos	0.0056 (0.139)	-0.0207 (0.142)	1.4845 (0.208)	2.1871** (0.009)	4.1016 (0.348)
Singapore	0.0096** (0.027)	-0.0073 (0.862)	0.1493 (0.857)	1.0689** (0.004)	0.0266 (0.542)
Malaysia	-0.0000 (0.972)	-0.0042 (0.758)	0.6270** (0.028)	1.5611*** (0.000)	-0.09842** (0.028)
Indonesia	0.0054* (0.053)	-0.0071 (0.108)	0.2084 (0.260)	1.1827*** (0.000)	-0.1266 (0.567)
Philippine	-0.0185*** (0.000)	-0.0000 (0.989)	8.0520*** (0.000)	7.9944*** (0.000)	-0.0057 (0.985)
Brunei	0.0036* (0.093)	0.0116** (0.022)	0.8731** (0.030)	1.2644*** (0.000)	-0.9966 (0.181)

The asterisks ***, ** and * denote the significance level at 1, 5 percent and 10 percent, respectively.

Since (PMG) is the top assessment method to apply in our study, then we analyses full PMG for individual level estimation. Myanmar, in which inflation and FDI have positive impact on export and the interest rate, exchange rate and GDP have negative impact on Myanmar's export at the 1% significant level. For Thailand, INF, EXR and GDP have positive impact on export and EXR and FDI have negative impact on export but statistically insignificant as the p -values are 0.68 and 0.22, greater than the 0.05 significance level. Thirdly, inflation (INF) of Cambodia has positive impact on the export performance of the country by 0.0032%. Fourthly, EXR and GDP of Vietnam have positive impact on the export performance of the country, with 1.5207% and 1.2100%, respectively. For Laos, only GDP has statistically significant positive impact on export. Singapore, in which INF and GDP have positive impact on export and the INEST, EXR and FDI have positive and negative impact to the Singapore's export, but the results are insignificant since p -values are 0.86, 0.86 and 0.54, respectively are greater than 0.05 significance level. The analysis of Malaysia's INF and INEST results are statistically insignificant. But the EXR, GDP and FDI have positive and negative impact on the export, respectively. For Indonesia, INF and GDP have positive impact on export and the INEST, EXR and FDI have positive and negative impact to the Indonesia's export, but the results are insignificant since p -values are 0.11, 0.26 and 0.57, respectively, are greater than the 0.05 significance level. For Philippine, EXR and GDP have positive impact on export and EXR has negative impact on export. Although, INEST and FDI have negative impact on export but they are statistically insignificant. Finally, INF, INEST, EXR and GDP for Brunei, have positive and negative impact on the export, respectively.

In summary results, Inflation of Myanmar, Thailand, Cambodia, Singapore, Indonesia and Brunei has remarkably influence on the evolution method of their export performance while Philippine is negative impact on export performance except Vietnam and Laos as shown in the Table 5. Moreover, INEST of Thailand and Brunei has remarkably impact on the growth process of their export performance while Myanmar is negative

impact on their export performance. Next results, EXR of Vietnam, Malaysia, Philippine and Brunei have remarkably impact on the growth process of their export performance while Myanmar is negative impact on export performance except Thailand, Cambodia, Lao, Singapore are Indonesia as shown in this table. Gross domestic product of Thailand, Vietnam, Lao, Singapore, Malaysia, Indonesia, Philippine and Brunei has remarkably impact on the growth process of their export performance while Myanmar GDP is negative impact on export performance except Cambodia as shown in the Table 5. Finally, foreign direct investment of Myanmar is remarkably impact on the growth process of their export performance while Malaysia is bad impact on export performance except Thailand, Cambodia, Vietnam and Laos, Singapore, Indonesia, Philippine and Brunei as shown in the above table.

Final Estimates for Export Performance and their Determinants of ASEAN Countries

This section describes about the ASEAN countries between export performance, and their export performance determinants, such as inflation, exchange rate, interest rate, GDP and FDI. The results are discussed based on the review of related literature and studies. Furthermore, the results are presented in an integrated manner to support the hypotheses developed earlier. Unit root test, co integration test, ARDL model; PMG and MG test and after financial crisis PMG cointegration test are developed for each export performance. The equation shows the direction of the variables and coefficients. At last, above analysis results are interpreted through one ways which are sign, coefficient, and *p*-value.

Table 7. Summary Results of Export Determinants

Test	Time	INF H ₁ (-)	INEST H ₂ (-)	EXR H ₃ (-)	GDP H ₄ (+)	FDI H ₅ (+)
PMG/MG Panel Results (ASEAN)	SR	0.00258 (0.317)	-0.0064* (0.077)	0.8196 (0.367)	1.541* (0.052)	-0.3455 (0.738)
	LR	0.0039* (0.0000)	-0.000 (0.853)	0.11** (0.009)	0.989*** (0.000)	1.12*** (0.000)

Notes: Null hypothesis; panel data has no-significant; p-value is larger than 5%. All hypothesis; panel data has significant; p-value is lower than 5% significance level. Values in the brackets are p-values.

Table 7 indications the summary effects of the export performance's determinants of ASEAN countries in short-term and long-term relationship. ASEAN countries export performance has significant relationship with export performance determinants. PMG & MG test results show that inflation (INF), exchange rate (EXR), GDP and FDI have significant positive relationship on export performance where only interest rate has negative relationship and statistically insignificant with export performance. Inflation (INF) has progressive connection with export performance where a unit increase in inflation leads to 0.0039 increases in export performance. This is supported by several researchers who state that ASEAN countries can benefit from low inflation with efficient policies actions through economic growth and increasing currency rate, as the buying rule of compare to other currencies to improve their performance. Kormendi & Meguire (1985), Nell (2000) found that inflation and economic growth are have positive relationship with their export performance. Another export performance determinant, interest rate is negative associated with export performance of ASEAN countries but is statistically insignificant. EXR has a positive relationship with export performance. This is supported by several researchers such as Fosu (1990), Sharma (2000), Edwards (2002), Dollar (2002), MacDonald & Ricci (2003), Fang and Miller, (2004), Jongwanich (2007) and Jorgen (2008). They stated that export performance can benefit from exchange rate system actions through watched analysed and governmentally manipulated economic measures and free market economy in world. GDP has significant positive relationship with export performance significance at 1% significance level. This is supported by several researchers who state that countries' export value can benefit from gross domestic product through goods and services production, consumption and income approach to economic growth Kumar (2014), Hsiao (2006), Nguyen (2010) point out even profitable ASEAN countries also adopts gross domestic product to improve their export performance. Finally, foreign direct investment (FDI) has positive relationship with export performance. This is supported by several researchers such as Dunning (2007), Helleiner (1973), Easterly and Rebelo (1993), Pfaffermayr (1994), Barry and Bradley (1997), Leichenko and Silva (2004), Pain and Wakelin (1997), Borensztein et al (1998), Zhang (2008), Amelia and Santos (2000), Clausing (2000), Liu, Wang and Wei, (2001), Michel Van Dijk (2002), Dritsakis et al (2004), Helpman et al. (2004), Greenaway and Kneller (2007), Iqbal et al (2010), Bibi and Ahmad (2014). They stated that ASEAN countries can benefit from international investment actions through high investment, technology transfer and other. The other theories Williamson, (1975) and Dunning (2007) show that country characteristics affect their decision of serving the foreign market.

4. Conclusion

This paper intends to observe the determinants of export performance of ASEAN countries from 2000 to 2015 using panel data analysis. Empirical results indicate that (FDI) and (GDP) are stationary at level $I(0)$ and (EXR) are stationary at $I(1)$. This means that there is mix stationary results at level or after first different. Mean group (MG) and pooled mean group (PMG) used in order to find out the relationship between the determinants of export performance in the short-run and long-run of selected states. Based on the results, inflation (INF), exchange rate (EXRATE), (GDP) and (FDI) have are positive relationship with export performance and statistically significant while only INEST has negative connection with export performance, but statistically insignificant. The whole variable also has a direction in accordance with the correlation theories and hypothesis. Among all variables, GDP growth has the greatest influence. And among all the independent variables are used; only the rate of exchange rate depreciation has insignificant effect on export performance in ASEAN. Regional integration started during of the 1980s such as NAFTA, MERCOSUR, AFTA, APEC. However, in the last three years, all ASEAN countries have agreed to consider and prioritize the improvement of infrastructure facilities, which are applied through some cooperation in the field of infrastructure, such as the ASEAN Infrastructure Fund (AIF). ASEAN Economic Community (AEC) integration has aimed to reach open trade region in goods and services, capital and labor movement. This is a new challenge for ASEAN members in sharing common goals. Free trade area would be anticipated to bring about rising per capital income, and social welfare. The application of this AEC itself was rated by many ways that also increase export performance through stability of INF, INEST and EXR and to getting higher GDP and FDI because ASEAN is also working with both side of domestic and foreign investors. WE can conclude that ASEAN members' countries have strong macroeconomic fundamentals with youthful population, CLMV and large unskilled labour force. ASEAN countries, can get improve quality for development by enhancing export performance and reducing the gaps between ASEAN countries with macroeconomic stabilizing policies of skill and knowledge of labours with advanced technologies, creation of new jobs opportunities, developing infrastructures and financial markets, and benefits through technology transfers which are complements for the domestic investors and businesses.

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