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STRATEGY TO ENHANCE INDONESIAN TRADE PERFORMANCE TOWARDS THE REST OF ASEAN-5 MARKETS

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ABSTRACT

International trade among ASEAN countries shows an increasing trend in the last five years. However, the trend does not apply to all ASEAN countries. Some of the countries enjoy significant increase in their export such as Singapore and Thailand, while some other, such as Indonesia, Malaysia, and the Philippines, do not enjoy such situation. This paper constructs a model of Indonesian trade policy to increase export through the dynamic change in export market share in ASEAN countries, and through speed adjustment in export commodities. The paper applies the co-integration and the Vector Error Correction Model (VECM) to help constructing the model.

Keywords**:** international trade, policy, ASEAN, speed adjustment

JEL Classification: G11, G15

INTRODUCTION

International trade has an important role in gross domestic product, the ultimate measure of economic activities in a given country. The role has been more important in ASEAN countries in the last five years, suggested by the positive trend in the volume of their international trade. However, the trend does not apply to all ASEAN countries. Some of the countries enjoy significant increases in their export such as Singapore and Thailand, while some others such as Indonesia, Malaysia, and the Philippines do not enjoy such situation.

In year 2008, Indonesia's export contributes 42% of total spending. The global financial crisis started in the mid 2008 has significantly reduced export of some key commodities such as textile, shoes, and furniture. It is hypothesized that the decline is caused not only by the global financial crisis which led to the decline in world market demand, but also by the decline in product competitiveness.

The decline in product competitiveness has caused a fall in the market share of Indonesian commodities in international markets. This has an impact both on macroeconomic aspects including the trade balance, current account, and power parity, and microeconomic aspects including the decrease in level of production and employment, as well as government revenue from tax of trade.

Indonesian economy has experienced several stages of economic growth. In the last five years the deficit fiscal policy has been applied to stabilize the economy and to increase export growth. The fiscal and monetary policies applied by the government did not significantly contribute to the economic stabilization and export growth. During the last ten years, Indonesia has been recording an average economic growth of 5% per year with inflation level of less than 10%. At the same period, its current account has been declining as the result of the decline in export. This has led to a decrease in trade surplus which is followed by the rapid increase in foreign debt.

Bank Indonesia reported that the total outstanding debt reached Rp 1,667 trillion in year 2008. Because global economic and financial crisis has influenced Indonesian economy since the mid of 2008, economic growth tend to lower than the previous years. It also has a negative impact on export growth which is followed by the decrease in export tax revenue. These might lead to fiscal crisis, a situation in which a huge government budget deficit becomes a source of serious multi economic and social crisis.

From the aforementioned problem, it is crucial to construct a model of policy strategy to increase export through the dynamic change in export market share in each country in ASEAN, speed adjustment in each commodities, and to measure the impact of export on fiscal sustainability. This paper builds a model of international trade performance enhancement strategy, especially the export performance of Indonesia through export market volatility analysis in ASEAN-5, adjustment speed analysis to respond shock of Indonesia's export to ASEAN -5, and dynamic analysis of Indonesia's export-import to ASEAN-5. The model is expected to increase market shares of Indonesia's exports in ASEAN, and increase power parity of key export products, especially commodities at SITC 0-9.

LITERATURE REVIEW AND METHOD

To trace the literature in international trade, we need to go back at least to the absolute advantage theory of Smith (1776), the comparative advantage theory of Ricardo (1817) and factor endowment theory of Heckscher-Ohlin (Heckscher and Ohlin, 1983). These theories motivate the free market to gain maximum advantage from international trade. They suggest that developed countries will trade more with developing countries, compare to that with other developed countries. However, the fact suggested that developed countries trade mostly with the other developed countries. This has triggered the emergence of alternative theories of international trade. Alternative theories such as product life cycle theory (Vernon, 1966) capture the motivation to export from the point of view of product stages production, ranges from innovation advantage to the abundance of labour advantage.

These theories explain the motivation to trade internationally. In the last few years, the more important issue has been in building a model to increase the export performance. Juswanto and Mulyati (2006), using constant market share analysis, found that product composition seems to be a main problem of Indonesia's manufactured exports. Indonesia's manufactured exports concentrated in products which is relatively low in world demand. This is shown by the fact that products under SITC 6 and 8 which constitute more than 50% of Indonesia's manufactured exports have lower world export growth than that of other products. The study also found that Indonesia's manufactured exports tend to concentrate in some specific markets such as Japan, NIEs (Singapore, South Korea, Taiwan, and Hong Kong), US, ASEAN and China, which absorb more than 60% of total manufactured exports of Indonesia. Those markets make a strong impact on the performance of Indonesia's manufactured export

Misanam *et al.* (2009) suggest building economic integration based on the religion value in order to get maslahah (advantage) through helping the inefficient countries. This also represents that the trade between Indonesia and some countries has not only been a trade per se, but also representing a tight cultural relationship among them. The finding is in the same spirit with the founding of some economic block building in Europe and Asia to strengthen regional trade

among them.

Apart from the aforementioned theories, some other papers talks about other aspects which might influence the process of international trade and strategy implication to maintain international trade performance. Hakim and McAleer (2008) investigate the volatility pullovers across financial markets and exchange rates. They suggest that fluctuation in one market influences the other markets in a more integrated international market. This implies that the performance of export in one commodity is influenced by that of other commodities, and that exchange rate remains an important variable in international trade, especially as more countries apply floating exchange rates system. This is an important issue in mapping the key products which are crucial to enhance export performance.

Hakim and Mc.Aleer (2009) provide evidence that conditional correlation across those markets are time varying, which implies that hedging is one of important strategies in international trade. As the fact has said, the financial crisis in Asia in year 1997-1998 was partly caused by the lack of hedging in international trade toward the fluctuation of exchange rates. With the collapse of US financial market and the emergence of the new common currency in Europe (Euro), one needs to consider a new venue of international trade along with the currency which is more stable in order to minimize the risk from exchange rate fluctuation.

This paper uses Cointegration and Vector Error Correction Model (VECM) of Johansen (1991) to analyse the dynamic behaviour of Indonesia's trade to the rest of ASEAN-5. Cointegration can be used to detect the presence of long-run equilibrium across dependent and independent variables appear in the model. VECM can help finding the causality relationship across dependent and independent variables in the model.

Generally, economic theories explain long-run phenomena. In the long-run there is equilibrium across variables, such as Indonesia's export and import to and from other countries, respectively. However, there might be disequilibrium in the short-run, which causes a shock. The presence of equilibrium in the long-run can be to test using cointegration approach. To detect the presence of shock and its impact on the dynamic of those variables, which may suggest the presence of causality relationship across variables, VECM can be used.

The co-integration-vector error correction model approach, does not only encompass both in level and in difference of variables in the model which capture the short and long run properties of the model, but also provides an attractive statistical framework and represents the concept of long run relationship between variables. With respect to the theory of co-integration, we need to analyze the time series properties of economic variables. It means that we have to satisfy ourselves weather the underlying data processes are stationary or not. In the case that the variables in question are not stationary and co-integrated series, the regression equations related to time series data are spurious. It means that testing for unit root and co-integration can be considered as a pre-test before making a valid regression.

Testing for co-integration and causality between the two or more variables need two steps of analysis. The first step is to verify the unit root condition or the test for order of integration of the variables since the causality test are valid if the variables have the same order of integration. Macroeconomic time series gen- t_σ erally contain unit roots and are dominated by stochastic trends. Unit root tests detect non-stationary that would invalidate standard empirical analysis. Standard test for the presence of unit root among variables based on the work of Dicky and Fuller (1981) is to investigate the degree of integration of the variables used in this empirical analysis. The Akaike information criterion (AIC) determines the optimal backward lag specification. Let, for example, variable of export (X_t) represents the export series for ASEAN-5 countries; the null hypothesis of unit root is tested using the DF *t*-test. The test statistic, $t_{s,}$ is the usual *t*-statistic for testing $H_0 : s_1 = 0$ in the following equation:

$$\Delta \log X_t = \sigma_0 + \sigma_1 B \log X_t + \sum_{i=1}^{k} \theta_i B^i \Delta \log X_t + e_t \quad (1)$$

Where, Δ refers to first difference**,** *B* is backward lag operator, and *k* indicates optimal backward lag based on AIC. The distribution of does not follow a student-*t* distribution, but its empirical distribution is tabu-

lated by McKinnon (1991). A rejection of the null hypothesis implies that the log export-import data is integrated of order 0, and is therefore stationary.

To allow for the possible presence of deterministic time trend, equation (1) is augmented with time trend component in order test the presence of unit root. So, the equation will be:

$$\Delta \log X_t = \sigma_0 + \sigma_1 T + \sigma_2 B \log X_t + \sum_{i=1}^{k} \theta_i B^i \Delta \log X_t + e_t \quad (2)$$

The augmented Dicky-Fuller (ADF) *t* statistic for testing the hypothesis of unit root, $H_0 : s_2 = 0$, is also based on the work of McKinnon (1991). If the null hypothesis of unit root in equation (2) is not rejected, the order of integration of log X_t could be one or higher. Therefore, we must proceed to test the presence of unit root for log X_t in the first difference form. The test statistic, t_{s_1} is the usual t-statistic for testing $H_0 : s_1 = 0$ in the following equation:

$$\Delta^2 \log X_t = \sigma_0 + \sigma_1 \Delta B \log X_t + \sum_{i=1}^{k} \theta_i B^i \Delta^2 \log X_t + e_t \quad (3)$$

A rejection of the null hypothesis implies that the log series is in the degree of integration 1. Furthermore, we can continue with testing co-integration among variables. Given the presence of unit root, the question becomes weather there is some long run equilibrium co-integrating relationship between variables.

The second step is to test the existence of co-integration between variables; meanwhile testing for causality will be used vector error correction model (VECM). According to Engle and Granger (1987), if two variables are integrated of degree I (1) and are co-integrated then either uni-directional or bi-directional Granger causality must exist in at least the I(0) variables. This temporal causality can be captured through the vector error correction model (VECM) derived from the long run co-integrating vectors (Granger, 1988). In this analysis we use the Johansen multivariate procedure (Johansen and Juselius, 1990) for testing the co-integration. The Johansen maximum likelihood allows testing multivariate frameworks and avoids some of the drawbacks of Engle-Granger (1987) co-integration methodology. Based on the Johansen and Juselius (1990), a VAR model is fitted to the data to find the appropriate lag structure. A VAR model of order *p* of time series data can be written as follow**:**

$$\Delta X_t = \pi B^i X_t + \sum_{i=1}^{p-1} \theta_i B^i \Delta X_t + e_t \quad (4)$$

The long run relationship in the data set is captured in the matrixp. The rank of the coefficient matrix p gives the number of co-integrating vectors. This estimation is based on the estimating the p matrix in an unrestricted form, and then test if the restrictions implied by reduced rank of p can be rejected. The rank of p is r, equals the number of co-integrating vectors, which is tested by the maximum eigenvalues (l_{max}) and trace statistics. Testing of the null hypothesis of at least r co-integrating vectors against the alternative hypothesis of full rank, based on the likelihood ratio trace test given by (5) and eigenvalue max by (6):

$$Q_r = -N \sum_{i=r+1}^{3} \log(1 - \lambda_i) \quad (5)$$

$$\lambda_{\max} = -N \log(1 - \lambda_i) \quad (6)$$

Where r = 0, 2, 3 and l_i is the i-th largest eigenvalue. The critical values of these statistics are obtained from Osterwald-Lenun (1992). The AIC is also used to determine the optimum lag (p) of equation (4). If the rank of p equals to zero or *p* (r = 0 or r = *p*), co-integration does not exist. So, co-integration only occurs in the condition of 0 < r < p.

This analysis involves utilization of the VECM modelling and testing for causality relationship between export and import for ASEAN-5. Engle and Granger (1987) exhibit that in the presence of the co-integration, there always exists a corresponding error correction representation which implies that the change in dependent variable are a function of the level of disequilibria in the co-integrating relationship, captured by error correction term (ECT), as well as changes in explanatory variables. Thus, through ECT and VECM modelling establishes an additional way to examine the causality. In the same way, we will develop the model, which has an explanatory variable and error correction

term (ECT) obtained from co-integration equation. The use of VECM is not only to get a valid regression, but also to explain the effect of government expenditure on output in short run phenomena for each country. After that, we also use impulse response analysis to capture dynamic interactions and speed of adjustments. In a simple model, the steps of causality analysis between export (*EX*) and import (*IM*) using VECM dynamic regression are developed as follow.

$$\Delta EX_t = \beta_{11} + \beta_{12}\Delta IM_{t-1} + \ldots + \beta_{1i}\Delta IM_{t-i} + \gamma_{11}\Delta EX_{t-1} + \ldots + \gamma_{1i}\Delta EX_{t-i} + \sigma_1 ECT_{1t} + v_t \quad (7)$$

$$\Delta IM_t = \beta_{21} + \beta_{22}\Delta IM_{t-1} + \ldots + \beta_{2i}\Delta IM_{t-i} + \gamma_{21}\Delta EX_{t-1} + \ldots + \gamma_{2i}\Delta EX_{t-i} + \sigma_2 ECT_{2t} + v_t \quad (8)$$

RESULTS AND DISCUSSION

This section applies the aforementioned methods on ASEAN-5 countries, namely Indonesia, Malaysia, Philippines, Thailand and Singapore, to explore the nature of trade among them. The analysis is conducted using cointegration and vector-error correction model (VECM). The paper uses export-import monthly data for the period of 2007-2009 measured in USD. The data are obtained from various series of annual report of International Financial Statistics. All the data are transformed to logarithm. The movement of the data throughout the year are then depicted in Figures 1 and 2.

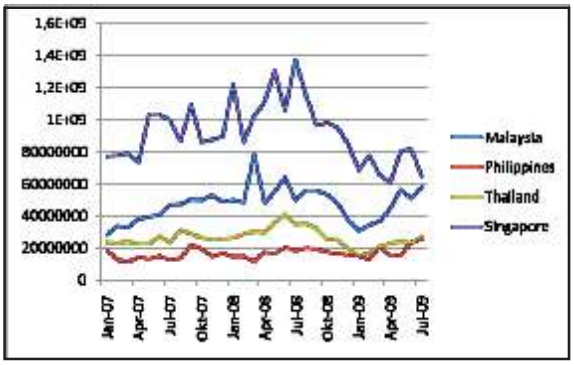

Figure 1
Indonesia's export to Selected Asian Countries (USD)

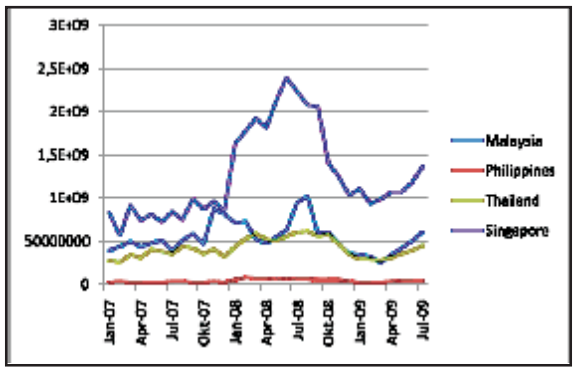

Figure 2
Indonesian Import from Selected Asian Countries (USD)

The results of unit root tests of the data series with and without time trend are presented in Table 1. The null hypothesis of unit root on the level cannot be rejected for all data series even at 10% level of significance. In contrast, the null hypothesis of unit root on the first difference can be rejected for all data series at least at 10% level of significance. It indicates that these series are all stationary and hence I (1).

Due to the Engle-Granger representation theorem (1987), cointegration test will be valid if a set of series data is stationary and has the same degree of integration. The cointegration test, therefore applied on these series and the results are reported in table 10. With Johansen procedure and optimum lag based on Akaike's criterion, the paper found 1 cointegrating vector for the variable export from Indonesia to Thailand, Singapore, Malaysia and Philippines. A cointegrating vector for the variable of Indonesia's Import from Thailand, Singapore, Malaysia and Philippines is also evidenced (Table 2).

From the empirical cointegration analysis, the result shows a long run relationship between export variables and import in these five countries. It also indicates that export will be effective in supporting import growth. These findings imply that vector error correction should be applied for Granger causality analysis. Granger (1988) points out that if a set of data series is cointegrated; it implies statistical causality in at least one direction. Furthermore, we need to analyze causality relationship using vector error correction approach.

Table 1
ADF Unit Root Test

Asean-4 Countries	Indonesia to/from	Level ADF	First Difference ADF
Singapore	Export	-1.247 (1)	-3.409 (2) ***
	Import	-1.276 (1)	-3.362 (2) ***
Malaysia	Export	-1.821 (1)	-3.983 (1) ***
	Import	-0.951 (1)	-3.8449 (1) ***
Thailand	Export	-2.147 (1)	-3.594 (1) ***
	Import	-2.129 (1)	-3.611 (1) ***
Philippines	Export	-1.482 (1)	-3.788 (2) **
	Import	-1.667 (1)	-3.867 (1) **

Note:
1) *, **, *** indicate 1, 5 and 10 percent level of significances, respectively.
2) Entries in parentheses indicate optimum lag based on AIC.

Table 2
Cointegration Test of Export-Import

Indonesia-Malaysia (VAR lag = 3)				
Null Hypotheses	λ - max	λ - max (5%)	Trace	Trace (5%)
Ho : r = 0	19.713*	17.89	32.216*	24.31
Ho : r ≤ 1	8.512	11.44	10.523	12.53
Indonesia-Thailand (VAR lag = 2)				
Null Hypotheses	λ - max	λ - max (5%)	Trace	Trace (5%)
Ho : r = 0	6.523	17.89	34.523*	24.31
Ho : r ≤ 1	17.231	11.44	10.112	12.53
Indonesia-Philippines (VAR lag = 3)				
Null Hypotheses	λ - max	λ - max (5%)	Trace	Trace (5%)
Ho : r = 0	18.776*	17.89	30.986*	24.31
Ho : r ≤1	9.552	11.44	11.443	12.53
Indonesia-Singapore (VAR lag = 3)				
Null Hypotheses	λ - max	λ - max (5%)	Trace	Trace (5%)
Ho : r = 0	21.233*	17.89	30.886*	24.31
Ho : r ≤ 1	11.412	11.44	11.523	12.53

Note: * indicates 5 percent level of significance.

The result of empirical causality test is reported in Table 3. The result shows that the coefficients of ECT in the model of Indonesia's export to the other countries in the model are statistically significant, except the coefficient of ECT to Thailand. The significance of those coefficients suggests the presence of disequilibrium in the short-run of the export from Indonesia to Malaysia, Philippines, and Singapore, which may also, suggests the tendency of the presence of shock in the short-run.

The coefficient of ECT in the model of Indonesia's import from the other countries in the model is not statistically significant, except the coefficient of ECT from Philippines. This suggests the absence of shock in the short-run (month-to-month adjustment) of the Indonesia's import from from Malaysia, Thailand, and Singapore. Indonesia's import from Philippines exhibits high level of dynamics, which needs month-to-month adjustment.

To summarize, there is disequilibrium of Indonesia's export to the rest of ASEAN-5 countries, signalled by the monthly adjustment. In addition, there is a tendency of the increase in Indonesia's import from the rest of ASEAN-5, while Indonesia's export experienced shocks, along with the decrease in its magnitude from year 2007 to 2009. It might be inferred that there is deterioration in Indonesia's export performance compares to the rest of ASEAN-5.

Table 4
Summary of Empirical Vector Error Correction Model Causality Test

Null Hypotheses	Results
Indonesia and Malaysia:	
Export does not Cause Import	Rejected *
Import does not Cause Export	Accepted
Indonesia and Thailand:	
Export does not Cause Import	Rejected *
Import does not Cause Export	Accepted
Indonesia and Philippines:	
Export does not Cause Import	Accepted
Import does not Cause Export	Accepted
Indonesia and Singapore:	
Export does not Cause Import	Rejected *
Import does not Cause Export	Accepted

Notes:
1) DLX is difference level of X
2) * indicates 5% level of significances of *F* statistic

Table 4 summarizes the empirical results of causality test based on vector error correction (VECM) approach. The analysis of Indonesia trade with the rest of ASEAN-5 countries shows unidirectional causality, that is, export causes import while there is no reversal causal relationship.

Table 3
VECM Causality Test of Export-Import Indonesia to/from ASEAN-4

Indonesia to/from	Dependent Variable	Intercept	F Statistic of Restriction Test ΔExport	ΔImport	ECT Coefficient
Malaysia	Δ Export	234.514(1.414)	-	0.024(3.344)	0.128(3.547)*
	Δ Import	453.810(0.233)	1.217(1.036)	-	0.056(1.427)
Thailand	Δ Export	134.614(1.284)	-	0.234(3.334)*	0.068(1.147)
	Δ Import	123.670(0.329)	1.217(1.016)	-	0.056(1.927)
Philippines	Δ Export	786.514(1.214)	-	0.024(3.344)*	0.268(3.147)*
	Δ Import	435.810(0.323)	1.417(1.216)	-	0.356(2.927)*
Singapore	Δ Export	532.534(1.234)	-	0.214(0.222)	0.348(3.147)*
	Δ Import	224.210(0.327)	0.432(0.234)	-	0.356(1.327)

Notes:
1) $\Delta X = (X_t) - (X_{t-1})$
2) Entries in parenthesis are the t statistics
3) * indicates 5 percent level of significance

From the data presented above, one can observe that an increase in export will eventually attract import from the same country with a higher amount. The results also show that Indonesia experienced the lost of competitiveness in the world market against those countries. This gives a picture of future position of Indonesia trade balance against those countries. This phenomenon suggests that prudential trade policy should be preferable.

As predicted, trade will flow from countries with higher efficiency to those with lower efficiency. From the empirical ground we need to see whether Indonesia has lower efficiency that it loss its competitiveness relative to the other countries. To see this, this paper uses business efficiency index as the proxy to efficiency. This proxy provides an early indicator of the production efficiency. To see the production efficiency one need to make a special research on it.

Looking at the index one might find that Indonesia is among the low rank in Asian selected countries. We may say that the trade is flowing from country with higher efficiency to the lower one, which supports the aforementioned model. Moreover, there is a need to compare the aforementioned model and the gravity model since their prediction is somewhat different. According to gravity model, the trade flow will be determined by the distance of both economies. The farther the position of two economies is the weaker the trade "gravity" between them which, accordingly, causes a lower magnitude of trade between them. This model poses a hidden assumption that the transportation cost matters. The real situation may depart from this prediction due to the high magnitude of efficiency.

CONCLUSION

International trade has played an important role in gross domestic product construction, and showed a positive trend in some ASEAN countries in the last five years such as in Singapore and Thailand. However, a country such as Indonesia did not enjoy such situation. This paper constructs a model of Indonesian trade policy strategy to increase export through the dynamic change in export market share in ASEAN countries, and through speed adjustment in export commodities. Based on vector error correction (VECM) approach, it can be inferred that Indonesian trade with these four countries showed unidirectional causality, hence export caused import while there was no reversal causal relationship. The results also suggest that Indonesia was experiencing the lost of competitiveness in the world market against those countries. This phenomenon suggests that prudential trade policy should be preferable. It can be concluded that Indonesia was the countries which has low performance in terms of international trade. It was therefore crucial to construct a policy strategy to increase export through the dynamic change in export market share, and to improve the commodity competitiveness in ASEAN countries.

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