Bounds Estimation for Trade Openness and Government Expenditure Nexus of ASEAN-4 Countries

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BOUNDS ESTIMATION FOR TRADE OPENNESS AND GOVERNMENT EXPENDITURE NEXUS OF ASEAN-4 COUNTRIES

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ABSTRACT

Southeast Asia countries are encountering several challenges as they are moving towards the globalization and trade liberalization era. Due to that, government intervention is essential in ensuring that the economy is resilience against the severe implications of trade openness. Therefore, this study aims to examine the relationship between trade openness and government expenditure of ASEAN-4 countries using the Autoregressive Distributed Lag [ARDL] bounds testing approach that covers a sample period of annually data from 1974-2006. Empirical results indicate that there is an existence of a significant positive long-run linkage between trade openness and government expenditure of all the ASEAN-4 countries under study. This means that government intervention in an open economy is crucial as to cushion the risks associated with trade liberalization.

Keywords: ARDL, ASEAN-4, openness, government expenditure

1. Overview

The Association of Southeast Asian Nations [ASEAN] countries with the exception of Singapore are mainly low- and middle-income developing countries whose economies share many resemblances related to their geographical location as well as common aspects of their culture, history, economic and social development. The main reason for the economic success of the ASEAN countries lies in their progressively increasing openness, in addition to the pursuit of relatively stable fiscal and monetary policies. Nevertheless, government intervention still remains influential in ASEAN countries with certain degree of protectionism via tariffs, quotas and other nontariff barriers to imports. The four main ASEAN countries namely Indonesia, Malaysia, the Philippines and Thailand (henceforth ASEAN-4) have dissimilar degree of economic freedom as well as government freedom. Based on the 2008 Index of Economic Freedom assessment, Malaysia has the highest freedom in economy, which rated at 64.5% freedom and ranked world's 51st freest economy. This is followed by Thailand (63.5%) ranked at 54th, the Philippines (56.9%) ranked at 92nd and lastly is Indonesia (53.9%) that ranked at 119th freest economy. On the other hand, among the ASEAN-4 countries that have most freedom from government is Thailand with 90.7% freedom, followed by the Philippines (90.2%), Indonesia (89.7%) and Malaysia (80.8%). Therefore, the total government expenditures, such as consumption and transfer payments are low in Thailand, the Philippines, and Indonesia with the percentage of 17.6%, 18.1% and 18.5% of GDP, respectively. In Malaysia, however, the government spending is in the range of moderate that equaled 25.3% of GDP.

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In related to that, the relationship between government expenditure and openness has received great attention of the researchers particularly during the era of globalization. Higher degree of openness of an economy may have greater government intervention. This is due to governments and markets are in fact complementary instead of being substitutes for each other. Besides, appropriate government policies are prominent in shoring up political support for trade (Rodrik, 1998). Most of the nations become more open to trade and their government sizes increase accordingly. Notwithstanding, the trade openness did lead to the expansions on the government size, it also can generate adverse heterogeneous effects from different countries, either developed or developing countries. Less developed countries suffer from a stronger effect of openness on volatility, although the effect has become weaker in recent decades. This seems to reinforce the view of Rodrik (1998) where for a given level of openness, bigger governments reduce output volatility. The government size effect seems to disappear in the case of less developed economies and the mitigating effect of government spending on output volatility still appears in the richer countries (Bejan, 2006). Therefore, it is interesting to study the relationship between the trade openness and government expenditure in the ASEAN-4 economies viewing that these countries are different in term of government size and level of trade liberalization.

The remaining of this study is organized as follows: In Section 2, we provide a brief literature review of the nexus between trade openness and government expenditure. The methodology is discussed in Section 3. Section 4 presents the empirical findings and discussions. Finally, we conclude in the last section.

2.   Literature Review

There are several previous studies investigating the linkage between trade openness and government expenditure. Economies that are more open have higher rates of industrial concentration, which tend to cultivate higher unionization, greater scope for collective bargaining, and stronger labor confederations. These will lead to larger demands for government transfers which intend to mitigate external risk (Cameron, 1978). Meanwhile, Rodrik (1998), Adserà and Boix (2002) and Albertos (2002) proclaimed that existence of positive linkage between trade openness and government spending is due to compensation hypothesis. The explanation is based on the fact that government acts as a risk bearer role in economies which is exposed to external risks as the degree of openness is high. Moreover, Alesina and Spolaore (1997), Alesina et al. (1997), Frankel and Romer (1999) and Bretschger and Hettich (2002) indicated that government size and trade openness are interrelated with country size. Smaller countries tend to have higher trade shares than the larger countries as the same amount of trade flows represents a different share of Gross Domestic Product (GDP). The countries will find it is less costly to split from their original countries where degree of openness is high.

Despite that, Balle and Vaidya (2002) have illustrated the relationship between international trade and openness to the size of nation's government as well as to specific categories of government spending. Higher degree of openness in fact has its cost at the state level, specifically expand the expenditure on public welfare and health services. This means that government is responding to the increased international trade activity by offering greater social protection. Meanwhile, Islam (2004) analyzed the relationship between government size and the economies openness from six organizations for Economic Co-Operation and Development (OECD) countries – Australia, Canada, England, Norway, Sweden, and the United State of America (USA). The finding indicated the existence of a long run relationship between government size, openness, terms of trade volatility, and external risk was found in USA and Canada, but not in the rest of four OECD countries. The empirical evidence presented by Islam (2004) show that the size of government remains constant to mitigate the

effects of increased income risks from greater openness that contrary to the argument and evidence developed using cross-section data.

3.   Methodology

In this study, the Autoregressive Distributed Lag (ARDL) bounds testing approach proposed by Pesaran *et al*. (2001) will be adopted to investigate the dynamic relationship between trade openness and government expenditure of ASEAN-4 countries. The reasons associated to the adoption of bound testing approach are due to the following advantages as pointed by Narayan and Narayan (2005):

i)   Bounds test obviates the uncertainty associated with pre-testing for unit roots as it does not require the information for the order of integration of the variables.

ii)   More robust for a small sample study compare to Engle and Granger (1987) or Johansen type of cointegation methods.

iii)   Long- and short-run parameters of the model can be estimated simultaneously.

iv)   Once the orders of the lags in the ARDL model have been appropriately selected, cointegration relationship can be estimated via simple ordinary least square (OLS) method.

The Unrestricted Error Correction Model (UECM) of the bounds test used in the present study has the following form as expressed in Equation (1):

$$\Delta \ln T_t = \beta_0 + \beta_1 \ln T_{t-1} + \beta_2 \ln G_{t-1} + \sum_{i=1}^{n} \alpha_i \Delta \ln T_{t-i} + \sum_{i=0}^{n} \gamma_i \Delta \ln G_{t-i} + \varepsilon_t \qquad (1)$$

where T and G are trade openness and government expenditure, respectively; Δ denotes a first difference operator; ln represents natural logarithmic transformation; β_0 is an intercept and ε_t is a white noise error term.

There are two steps in testing the cointegration relationship between trade openness and government expenditure. First, the Equation (1) is estimated by OLS technique. Second, the null hypothesis of no-cointegration H_0: $\beta_1 = \beta_2 = 0$ is tested against the alternative of H_1: $\beta_1 \neq \beta_2 \neq 0$ by the means of F-test. Since the sample size used in this study is relatively small, we utilize the F-statistics for critical value bounds that are generated by Nayaran (2005). If the computed F-statistic falls below the lower bound critical value, the null hypothesis of no-cointegration cannot be rejected. In contrast, the null hypothesis is rejected if the computed F-statistic lies above the upper bound critical value. This implies existence of a long-run cointegration relationship amongst the variables in the model. Nevertheless, if the calculated value falls within the bounds, inference is inconclusive.

We follow the general-to-specific procedure by Hendry and Ericsson (1991) to obtain the parsimonious UECM by dropping sequentially the insignificant first difference variables. The long-run elasticity of the independent variable is calculated using the ratio of the estimated coefficient of one-lagged independent variable over the estimated coefficient of one-lagged dependent variable (multiplied with a negative sign). As for the short-run elasticity of the independent variable, it is captured by the estimated coefficients of the first differenced variable in Equation (1).

In this study, yearly data of trade (summation of export and import) and government expenditure of ASEAN-4 countries from 1974 to 2006 were obtained from *International Financial Statistics* published by International Monetary Fund (IMF). All the data are transformed into log form prior estimation is conducted.

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4.   Results and Discussions

The ARDL bounds test estimation result is reported in Table 1. The model is well fitted as it passes all the diagnostic tests, namely Jacque-Bera normality of the residuals test, Breusch-Godfrey serial correlation LM test, ARCH test and Ramsey RESET specification test. This indicates that the residuals of the estimated model are serially uncorrelated and normally distributed with constant variance in a correct functional form. Furthermore, the estimated parameters are structural stable over time as the plots of the CUSUM and CUSUM of square statistics are well within the 5% critical bounds.

The empirical results indicate existence of long-run relationship between trade openness and government expenditure among the ASEAN-4 countries by comparing the computed *F*-statistic against the critical values provided by Narayan (2005). The reported *F*-statistic values in Table 1 are at least greater than the upper bound critical value of 4.47 at the 10% level of significance. Interestingly, results show that homogenous trend of significance positive long-run linkages between trade openness and government expenditure for all the ASEAN-4 countries. Moreover, the elasticity values in Table 1 indicate that the government expenditure of Malaysia has greater impact on the trade openness in relative to Thailand, Indonesia and the Philippines.

The results obtained in this study are corresponding to the findings of Rodrik (1998), Adserà and Boix (2002) and Albertos (2002) who stated that there is an existence of long-run positive relationship between trade openness and government expenditure. This is due to the economic system adopted by ASEAN-4 countries, which is mixed economy system. In fact, the economic success of ASEAN-4 countries relies on their steadily increasing in openness. Lack of the government intervention without concentrated to the economic insecurities generated by liberalization and globalization may harm the prospects of sustainable economic growth of the countries. This is due to the extreme competitive pressures faced by ASEAN-4 countries as they are moving towards liberalization and globalization. As a result, domestic firms might not have the ability to overcome the challenges of the liberalization impacts. Therefore, the government plays prominent role in ensuring stability in the economic and acts as risk bearer in mitigating eternal risk due to the high degree of trade openness.

Despite that, respective country size of ASEAN-4 countries also contributed to the different elasticity values of government expenditure towards trade openness. The higher trade shares over GDP as applied to Malaysia and Thailand indicate that smaller countries have the tendency of higher trade shares and therefore lead to higher government expenditure. As country size is smaller alike Malaysia and Thailand in term of GDP, comparatively, both countries participate aggressively in the international trade activities that lead to higher trade share. Therefore, intervention government in the economy is crucial as to cushion the severe risk from the trade liberalization. Furthermore, public spending is a risk-reducing instrument on which there is greater reliance in more open economies[1]. This is in line with findings of Alesina and Spolaore (1997), Alesina *et al*. (1997), Frankel and Romer (1999) and Bretschger and Hettich (2002).

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[1] See for example: Bates et al. (1991).

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TABLE 1: The ARDL Bounds Estimation Results

	Indonesia	Malaysia	Philippines	Thailand
Computed F-Statistic	5.35*	5.12*	8.39**	6.72**
Decision	Reject H_0	Reject H_0	Reject H_0	Reject H_0
Long-run Elasticity:				
Constant	0.32**	0.23*	0.63***	0.16*
Government Expenditure	1.34**	1.92***	1.29***	1.75***
Short-run Causality:				
Government Expenditure	18.36***	2.65*	43.14***	26.43***
Diagnostic Test:				
JB	1.03 [0.59]	1.27 [0.53]	0.58 [0.75]	1.07 [0.59]
AR[2]	2.01 [0.16]	0.25 [0.78]	0.99 [0.39]	0.92 [0.43]
ARCH[1]	0.23 [0.63]	0.23 [0.63]	0.06 [0.81]	0.00 [0.98]
RESET[1]	1.05 [0.32]	0.03 [0.86]	0.93 [0.35]	0.93 [0.35]
CUSUM	Stable	Stable	Stable	Stable
$CUSUM^2$	Stable	Stable	Stable	Stable

Notes: The 5% and 10% lower and upper bounds critical values are 4.27 & 5.47, and 3.44 & 4.47, respectively. The bounds critical values are obtained from Narayan. (2005, pp. 1988). JB is the Jarque-Bera statistic for testing normality. AR[2] is the Lagrange Multiplier test of 2nd order serial correlation. ARCH[1] is the 1st order test for ARCH. RESET refers to Ramsey RESET specification test. CUSUM and $CUSUM^2$ are the cumulative sum of recursive residuals stability test and cumulative sum of squares of recursive residuals stability test, respectively. Asterisks (*), (**) and (***) denote significant at 10%, 5% and 1% levels, respectively.

5.   Conclusion

ASEAN-4 countries had undergone dynamic economic development particularly in trade liberalization effort as to adapt to the globalization era. Nevertheless, involvement in trade activities indicates higher degree of openness of a country and therefore leads to tremendous external risk. Due to that, this study aims to examine the degree of government roles towards trade openness of ASEAN-4 countries. Empirical results from the ARDL bounds test indicate that a positive long-run relationship exists between trade openness and government expenditures in all of the ASEAN-4 economies. In addition, the government expenditure can Granger cause the level of the trade openness in short interval. The main reasons is due to the role played by the government as a risk-bearer to mitigate the external risk generated from the higher degree of openness. It indicates that when the trade becomes more liberalized, the government expenditure will be a vital tool to lessen the external risks and to protect the infant domestic industry as well. Conversely, if the trade liberalization has been limited, the growth might be in a status of volatile. Hence, in turn to boost the economic growth, trade openness is very important to come with some government interventions that serve the role as stabilizer in the economies.

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