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EXPORT, ECONOMIC INTEGRATION AND EXCHANGE RATE VOLATILITY IN TURKEY AND MALAYSIA

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ABSTRACT

Using annual data (1970-2004), this study re-examined the hypothesis that exchange rate volatility may dampen export demand in Malaysia and Turkey. In particular, this study attempts to investigate the impact of exchange rate volatility on exports after taking into consideration the presence of regional economic integration. In addition, the role of regional economic integration in promoting export is also of concern to this study. The empirical evidence demonstrates that despite the significant, minimal impact of membership to regional economic integration for both economies, regional integration remains an important and valid approach for future economic development for both economies. Meanwhile, similar to the findings of previous studies the impact of exchange rate volatility on exports is consistently negative. However, it is no longer significant in the case of Turkey.

Keywords: Export; Exchange rate volatility; Economic integration.

1. INTRODUCTION

Economists have reached a certain degree of consensus that an outward-oriented strategy generally works very well in promoting economic growth. The prominent example is the case of Southeast Asian (ASEAN) economies. In particular, Singapore, which has experienced remarkable growth performance and is considered the most open economy in the region. This is then followed by Malaysia, Thailand, and Indonesia. Meanwhile, as far as core ASEAN-5 economies are concerned, the Philippines is not only the least open economy, but also the poorest performing economy. This simple illustration offers support to the perception that an outward-oriented policy is generally the best policy to proceed with. In line with this evidence, Malaysia has been promoting an outward-oriented development strategy since the late 1980s and subsequently has achieved impressive growth performance (Athukorala and Menon, 1999).

Similarly, noting the importance of an outward-oriented development strategy, the Turkish government started to switch its emphasis from an import substitution development strategy to an outward-oriented development strategy (Kizilca and Ozcan, 2008). As a result, Turkish real industry growth rates have improved significantly from a negative growth rate (- 5.0 percent) in 1979 to an average growth rate of 7.73 percent in the 1980s and 4.4 percent in the 1990s. The data is taken from Table 1 of Kizilca and Ozcan (2008) and recalculated to get the average growth rate. This growth-enhancing outward-oriented policy is also justified by several empirical works such as Halicioglu (2007) and Taban and Aktar (2008). However, as stated by Hook and Boon (2000), an economy that applies open economic policy has to expose itself to exchange rate fluctuation. This is because an openness policy will normally be followed by an increase in cross-border capital flows through capital account liberalization. Although the benefit of short-term capital has been highlighted by Masron and Yusop (2007) as contributive in the form of assisting trade transactions, a speculative kind of flow may create pressure for currency to fluctuate. Simple correlation analysis in Masron and Yusop (2007) reveals that a drop in trade volume is highly correlated with currency fluctuation. Thus, the effort to promote export has an intimate connection with exchange rate policy.

The issue of exchange rate policy and its implication on trade is not a new issue. Particularly, the choice of an exchange rate regime has long been a concern to economists. For example, Mundell (1961), McKinnon (1963), and Obstfeld and Rogoff (1995), among others, argue that a fixed exchange rate has its cost in terms of developing and maintaining credibility, and the exchange rate should not be the target

of monetary policy, but rather can be used as an indicator. The alternative of fixing exchange rates is to float the exchange rate. The prolonged debate on the choice of exchange rate regime is because of two major problems, namely, exchange rate misalignment and exchange rate volatility. Exchange rate volatility that goes with flexible exchange rates was seen to be costly and disturbing to an economy in terms of resource (labour and capital) allocation among sectors in response to exchange rate changes (Mann, 1999, Cooper, 1999). In addition, exchange rate volatility could also be a risk for trade transactions that cannot be hedged at moderate cost. Finally, it could lead the economy towards 'self-aggravating' movements in exchange rates, exacerbating disequilibria (Cooper, 1999). Nevertheless, it does not mean that a fixed exchange rate is the best option and, therefore, must be chosen. Recent developments in the debate on the choice of exchange rate have found another serious problem pertaining to exchange rates that stem from the fixed exchange rate regime. A fixed exchange rate creates the seeds of great economic disruption if the rate diverges from its true value. This phenomenon is termed exchange rate misalignment. At worst, a nation can no longer defend the fixed rate, capital and reserves flow out of the country, a bailout is necessary, and debts need to be restructured (Mann, 1999). Leaving the issue of exchange rate misalignment for future study, this study focuses on the implications of exchange rate volatility on exports.

In other developments there is growing interest about regional economic integration, either bilateral or multilateral. Without exception, Malaysia and Turkey have also considered this issue after exploring the possible benefits that can be derived from the formation of any kind of economic integration. Malaysia is very keen to enhance the level of integration in the ASEAN region under the proposal of the ASEAN Free Trade Area (AFTA) while Turkey is currently exploring becoming a fully fledged member of the European Union. Whether or not economic integration can really be fruitful for both economies remains an open question. Hence, this paper tries to shed more light on the relationship between volatility of exchange rates with the export volume in Malaysia and Turkey, in particular, the impact after joining regional economic integration.

The organization of this study is as follows. The next section will discuss the literature review. The theoretical framework that will be used to describe the empirical specification will be presented in section three, and, thus, the empirical specification and data collection will be in section four. Section five will deal with the results and interpretation, while finally the concluding remarks will end this paper.

2. MALAYSIA, TURKEY AND REGIONAL ECONOMIC INTEGRATION

2.1 Malaysia and AFTA

This section relies heavily on Soesastro (2005). Malaysia is one of the founders of the Association of Southeast Asian Nations (ASEAN) with regional security being the initial objective of the formation. As time passed, the motivation of ASEAN changed, transcending the security aspect and encompassing the economic development of the members. This idea was initiated after the success of the European Union. The objective to enhance the level of economic development of the members is mirrored by the proposal of AFTA in 1992. Currently, ASEAN has progressively advanced the completion date of AFTA and moved to a zero tariff end goal. This ambition is reflected in the shift from the initial decision to complete AFTA within 15 years (from 1993 to 2008) being accelerated to 2003. The new members of ASEAN, which automatically must also participate in the AFTA integration project, were given a longer time frame of 10 years to reduce most of their tariffs to 0-5 percent.

Unfortunately, to date, the implementation of economic integration under AFTA has not been impressive. More worrying, however, has been the backtracking from the original commitment by some members. Furthermore there has been little progress on the removal of non tariff barriers because there has been no agreement on what this entails.

Recently, the concept of the ASEAN Economic Community (AEC) has been introduced to strengthen the original idea of AFTA. Nevertheless, if we compare the AEC with the EU, the core elements of the AEC are really just the bare minimum. The AEC is one of three pillars (the other two being the ASEAN Security Community and the ASEAN Socio-cultural Community) that make up the ASEAN Community as declared by ASEAN leaders in the Bali Concord II. In line with the ASEAN Vision 2020, it is envisaged that the

AEC will be a single market and production base with free flow of goods, services and labor (Hew and Soesastro (2003) offer some details). ASEAN governments have many options to broaden and deepen the integration. A number of areas appear to be prospective elements for consideration by ASEAN governments. These include: (a) complete liberalization of services; (b) adoption of a progressively liberal regime to regulate the flow of unskilled labour; (c) financial integration; and (d) macroeconomic policy coordination.

In a nutshell, if we use regional trade (bilateral trade) as an indicator to measure the extent of its success, we can conclude that the result is less impressive. As shown in Table 1, from the introduction of AFTA until recently, there has been no significant improvement in the level of regional export of Malaysian products to other ASEAN members. More worryingly, the level of extra-ASEAN trade seemed to increase over time since the introduction of AFTA in 1992. Accordingly, it raises a question of whether the complete fruition of AFTA can be materialized or not. If so, the next question is whether it will be a growth-enhancing or stability-promoting FTA.

Table 1: Malaysia's Exports to ASEAN and Non-ASEAN Countries (as % of Total Exports)

	To ASEAN ^a	To non-ASEAN ^b
1993	28	53.69
1995	27	53.56
2000	25	52.24
2002	24	54.26
2004	25	54.29

Note: ^a ASEAN refers to ASEAN-8, or with the exception of Lao, Myanmar and Timor Leste due to data unavailability.

^b Non-ASEAN represented by top-8 export destinations for Malaysia's exports, namely, United States, Japan, Hong Kong, Netherlands, United Kingdom, China, South Korea and Germany.

Source: ASEAN Secretariat (2005) and ADB (2006).

2.2 Turkey and European Union

This section is basically a summary of studies done by Erzan et al. (2002), Karakaya and Ozgen (2002), Utkulu and Seymen (2004), Akkoyunlu-Wigley et al. (2006) and Akgüngör and Falcioğlu (2005). In the 1980s, the need for foreign markets led Turkey to try to strengthen cooperation with trading partners worldwide with initial attempts being made to tie trade with the Middle East. In the meantime, Turkish business people also worked to improve trade with countries in North America, East Asia, and Eastern Europe. With the apparent protectionist climate of the mid- and late 1980s, policy makers showed their interest in integrating with the rest of the world, particularly with those having a close relationship such as the Middle Eastern and West European economies.

The relationship between European countries (EC) and Turkey started when Turkey applied for as an associate member to the European Economic Community (EEC) in 1959 (Utkulu and Seymen, 2004). This relationship is further strengthened in the early 1970s when both adhered to the terms of a 1973 protocol for reducing trade barriers. The EC began granting preferential treatment to most Turkish agricultural imports, and Turkey was given a period of twenty-two years to align its agricultural policies with the EC's Common Agricultural Policy. However, this good relationship deteriorated in the late 1970s. EC imposed quotas and other restrictions on certain Turkish imports and, in retaliation, Turkey applied levies on imports of European iron and steel. The situation became worse after 1981 when the EC suspended financial assistance of around 600 million European Currency Units for violating human rights under Turkey's military government.

In 1983, Turkey's government returned from military to civilian. Subsequently, political relations between Turkey and EC countries began to improve. In April 1987, Turkey's government made a formal application for EC membership but the European Commission proposed that negotiations should not begin until 1993. Further negotiations led the EU to vote for Turkey's inclusion in the free-trade area in 1995. Turkey, signed a Customs Union Agreement with the EU in March 1995, which came into effect at the beginning of 1996 (Karakaya and Ozgen, 2002). The implication of this agreement actually went far beyond a basic custom union framework that stipulates free international trade and common external

tariffs. Indirectly, it has given a new impetus to the liberalization process in Turkey (Utkulu and Seymen, 2004).

Table 2: Turkish Exports to EU and Non-EU Countries (as % of Total Exports)

	To EU ^a	To non-EU ^b
1993	54.7	21.3
1995	57.6	15.0
2000	52.6	14.6
2002	53.6	12.7
2004	54.2	11.1

Note: ^a EU refers to EU-13, consisting of Germany, Austria, Bulgaria, France, the Netherlands, United Kingdom, Spain, Switzerland, Italy, Poland, Romania, Russia and Greece. ^b Non-EU is represented by the United States, China, Iran, Libya, Egypt, Syria and Saudi Arabia.

Source: Statistical Indicator 1923 – 2004 (Turkish Statistical Institute, 2007).

Table 2 demonstrates the direction of Turkish exports to selected EU members and non-EU countries. The importance of Turkey joining the EU is justified from Table 2 where the magnitude of exports to EU members exceeds 50 percent of total Turkish exports. In other words, Turkey can ensure demand for its products and, thus, growth rates of GDP by joining the EU even though there is no significant improvement in terms of increasing demand for Turkish exports. In contrast, the ratio of Turkish exports to non-EU members is declining and, therefore, to be allied with the EU is expected to be a growth-enhancing strategy.

3. LITERATURE REVIEW

There is much interest in how exchange rate uncertainty affects real macroeconomic variables, with most attention given to trade. Obstfeld and Rogoff (1995) noted that many economists believe that exchange rate uncertainty reduces international trade. However, it is not fully clear whether exchange rate uncertainty will surely and negatively affect trade, from either a theoretical or empirical standpoint. Early theoretical work regarding the question of exchange rate uncertainty includes Eithier (1973) who found that the level of trade is unrelated to exchange risk when forward rates are taken as exogenous. On the other hand, Vianne and de Vries (1992) showed that exchange rate risk can be passed onto the forward rates and thus trade can be affected either positively or negatively.

In particular, the level of trade depends on preferences and the monetary policy rules followed by monetary authorities. It is argued that if traders are risk averse, exchange rate volatility will reduce foreign trade since an increase in unanticipated volatility can increase the cost of doing trade. If payment is not made until delivery, then unpredictable changes in the exchange rate between the time of the contract and delivery can increase uncertainty for the expected profits from exports. Therefore, uncertainty in exchange rates may reduce profit expectations and, hence, reduce exports. It has also been suggested that an increase in exchange rate volatility will reduce trade if hedging is not possible or is expensive (Arize 1997; McKenzie, 1998). Fears about the effects of exchange rate volatility on foreign trade have contributed to a shift in opinion away from floating exchange rates towards systems of exchange rate management, such as the exchange rate mechanism of the European Monetary System, and attempts at worldwide policy coordination to attenuate exchange rate fluctuations.

The empirical literature on the effects of exchange rate uncertainty on trade patterns is extensive. It is widely believed that exchange rate volatility, which will increase the risk of undertaking international trade, has a negative effect on exports (Hooper and Kolhagen, 1978; Rana, 1981; Arize et al., 2000, 2003; Levine and Carkovic, 2001; Doganlar, 2002; Rey, 2006). On the empirical side, Gupta (1980) estimated the export supply function for five countries and found that export supply was negatively related to short-term volatility in the nominal exchange rate. Rana (1981) examined several Asian countries and found that volatility had a negative effect on import volume in the case of Korea, Taiwan and the Philippines. Arize et al. (2000) also found a negative relationship. Arize et al. (2003) empirically investigate the impact of exchange-rate volatility on the export flows of ten developing countries on a quarterly basis between 1973 and 98. By utilizing the theory of cointegration they obtained results indicating that an increase in

the exchange-rate volatility exerts a significant negative effect upon export demand in both the short-run and the long-run in most of the countries studied, which included Turkey. The results are in line with the theoretical considerations and may be the result of significant reallocation of resources by market participants. Rey (2006) investigates the impact of nominal and real effective exchange rate volatility on the exports of six Middle Eastern and North African (MENA) countries to 15 member countries of the European Union (EU), for the period 1970Q1-2002Q4. The cointegration results indicate a significant relationship, but with mixed relationship between exports and exchange rate volatility. Negative relationships are observed in the cases of Algeria, Egypt, Tunisia, and Turkey and positive for Israel and Morocco. Doganlar (2002) examines the impact of exchange rate volatility on the exports of five countries – Turkey, South Korea, Malaysia, Indonesia and Pakistan – and the results indicate that the exchange rate volatility reduced real exports for these countries. This phenomenon might well be explained by the level of risk-averseness of the producers in these countries. Therefore, the producers will prefer to sell in domestic markets rather than foreign markets if the exchange rate volatility increases. Vergil (2002) empirically investigates the impact of real exchange rate volatility on the export flows of Turkey to the United States and its three major trading partners in the European Union for the period Jan 1990 to December 2000. The results obtained in this paper demonstrate that real exchange rate volatility has a significant negative effect on real exports.

On the other hand, McKenzie and Brooks (1997) and Klein (1990) found some evidence for a positive effect of exchange rate volatility on trade flows. The same inverse relationship between exchange rate volatility and trade evidence also exists with regards to developing countries. In the extreme case, Warner and Kreinin (1983), McKenzie (1998) and Aristotelous (2001) found no evidence of the existence of a relationship between export flows (or trade) and exchange rate volatility. Levin and Carkovic (2001) examined the effect of exchange rate volatility on growth in 73 countries for the period of 1960 to 1995, and found that volatility is statistically insignificant. They concluded that the effect of exchange rate volatility is hidden in other variables. According to them, volatility causes a risk premium to be assessed on exchange rates, thus pushing up the interest rate. It indirectly reduces investment, tax revenues, economic growth and the ability of exporters to sell goods abroad. Recently, departing from the conventional approach of partial equilibrium of regression analysis, Bacchetta and Wincoop (2000) used a general equilibrium framework that allows for deviations from purchasing power parity to analyze the question of whether exchange rate stability associated with a fixed exchange rate regime necessarily implies an increase in international trade. They found that the level of trade is not dependent on the exchange rate regime.

Finally, let us focus on the literature investigating the relationship between economic integration and economic growth. Later, this study narrows down the discussion to identify the impact of economic integration on exports which is one of the sources of economic growth. Concerning the growth effect of economic integration, it can be said that the results of the economic integration-growth relationship are mixed. Henrekson et al. (1997), found a positive coefficient dummy for participation in the European Union in cross-country growth regressions and suggests that regional integration may not only affect resource allocation, but also long-run growth rates. Baldwin and Seghezza (1996) also find that foreign R&D increases domestic total factor productivity of EU countries and, therefore, reached the conclusion that EU membership led to knowledge-led growth. Ben-David (1993) showed that trade agreements in Europe have caused convergence. In a recent study, Badinger (2005) also found a positive temporary growth effect of European integration using a panel of fifteen EU member states over the period 1950-2000. In contrast to the above findings, Vamvadakis (2002) shows mixed evidence on the effects of economic integration on growth. Similarly, de Melo et al. (1992) estimate a growth equation including dummy variables for each trade bloc and found no long-run growth effects of regional economic integration except in the case of the Southern African Customs Union. In the neutral case, Vanhoudt (1999) found no growth effect of European Integration. Moving on to the discussion about the impact of regional economic integration on exports, Utkulu and Seymen (2004) made an attempt to measure the impact of integration with the EU on Turkish exports over the period 1963-2003. They used a time trend to proxy a level of economic integration by assuming that the process of integration has been continuous. Thus we include a time trend in the model to allow for the possibility of continuous integration effects. In conclusion, coupled with exchange rate adjustments, the increasing integration into the EU has been

effective in leading to a massive boost in the export growth of Turkey (Utkulu and Seymen, 2004). Another study by Akkoyunlu-Wigley et al. (2006) also concludes similar implications for integration into the EU, but with a different way of how it works. According to Akkoyunlu-Wigley et al. (2006), the volume of imports from the EU has a greater impact on Turkish productivity than domestic research and development activities.

4. METHODOLOGY

4.1 Empirical Model Specification

A study of Yusoff (1994) on the export of Malaysian manufacturers suggested that if the export demand model did not include the exchange rate as a separate variable, then the estimates of the elasticities are biased downward and inefficient. Yusoff (1994) formulated a model that takes into account the above weaknesses to improve the model and the results of the previous studies. This approach, which is in line with the suggestion made by Chowdhury (1993) and McKenzie (1998), will be utilized in this study. Using a traditional export demand function with slight modification by adding exchange rate volatility and regional economic integration (RI) membership, the long-run equilibrium export function can be written as:

$$\ln EX_t = \beta_0 + \beta_1 \ln Y_t + \beta_2 \ln FY_t + \beta_3 ER_t + \beta_4 ERV_t + \beta_5 RI_t + \varepsilon_t \quad (1)$$

where EX is real exports, Y stands for domestic gross domestic product, FY is world income, ER stands for real exchange rate, ERV is the measure of exchange rate volatility and RI denotes regional economic integration membership. Yusoff and Baharumshah (1993), who analyzed the effect of real exchange rate on the demand for exports of primary commodities, found that the impact or ability of real exchange rates to influence the demand for Malaysian exports is small. Nevertheless, the inclusion of exchange rates remains vital in ensuring no misspecification problem. The issue of whether to use real exchange rates or nominal exchange rates has been challenged by McKenzie and Brooks (1997) who argued that it would be irrelevant whether the volatility coefficients are estimated from real or nominal exchange rates as the volatility is sourced solely from the nominal exchange rate. For world income, we use the sum of five major export destinations' GDP as a proxy. In the case of Turkey, the five major export destinations are the U.S., U.K., France, Italy and Germany while for Malaysia, the five countries are the U.S., Singapore, Japan, Hong Kong and the Netherlands. This could be considered as a contribution of this study to the literature as normally the world GDP is proxied by the GDP of one major export destination like the U.S. t is the time dimension and ε is the residual term. The reason for adding domestic income is very clear from the literature that there is Granger causality, running from domestic GDP to exports. This means national income can be considered as one of the important determinants of exports. The reason for adding exchange rate volatility, along with the exchange rate itself, is because it has become the main concern of the traders. Exchange rate volatility will create uncertainty on the prospect of profitability and is surely of great concern among traders, particularly to those who are risk averse.

Finally, we add the regional economic integration membership as an attempt to quantify the possible effect of RI on export activities. For Malaysia, we set the dummy as 0 before the initiation of AFTA in 1992 and 1 from 1992 onwards. However, in the case of Turkey the set up of the membership dummy is more complicated as the process of full accession into EU is still ongoing. At the moment, this study concludes that by agreeing to a customs union in 1995 this is the best turning point to represent Turkey's effort to have closer integration with the EU although Turkey has been a candidate country for fully joining EU since 1999 (EC, 2007).

One would expect that increases in the real GDP of trading partners (or the rest of the world) could result in a greater volume of exports to those partners. In addition, the real exchange rate depreciation (an increase in the level of directly quoted exchange rate) may lead to an increase in exports due to the relative price effect. As explained in the introduction, the relationship between the volatility of the real exchange rate and the real exports is ambiguous. Finally, membership of regional integration is expected to induce a positive impact, otherwise countries may no longer be willing to join the integration (see e.g. Madsen and Damania, 1994).

4.2 Measurement of Exchange Rate Volatility

Several measurements for exchange rate volatility can be found in the literature. As summarized by Rahmatsyah et al. (2002), there are at least six measurements available in the literature such as standard deviation (with or without moving average), variance of exchange rate, ARIMA model and the ARCH model.

As for this study, a generalized autoregressive conditional heteroscedastic (GARCH) model developed by Bollerslev (1986) was constructed in order to parameterize the conditional variance of exchange rate. See Hansen and Lunde (2001) for a detailed discussion on the issues surrounding measuring volatility. The strength of GARCH to be used is due to its capability to capture the unexpected volatility and the time-varying conditional variance. The GARCH model is basically the extension of the autoregressive conditional heteroscedastic (ARCH) model. Bollerslev (1986) extended the ARCH model by including a lagged value of the conditional variance and specifying the conditional variance to be a linear combination of p lags of the square residuals from the conditional mean equation and q lags of the conditional variance. If the error process be such that $\varepsilon_t = v_t \sqrt{h_t}$, where $\sigma_v^2 = 1$, then the residual series is modelled as a *GARCH* (p, q) process as demonstrated below:

$$\varepsilon_t | \Omega_{t-1} \sim N(0, h) \quad (2)$$

$$h_t = \theta + \sum_{i=1}^p \beta_i \varepsilon_{t-i}^2 + \sum_{i=1}^q \alpha_i h_{t-i} \quad (3)$$

Where θ , β and α are restricted to be positive to ensure the possibility that the conditional variance (h_t) is positive. Besides that, $N(0, h)$ indicates the conditional density through zero mean and variance, h . This model allows the conditional variance of ε_t to be an autoregressive moving average (ARMA) process. Hence, the optimal *ARMA* (p, q) process is selected based on the Akaike Information Criterion (AIC).

4.3 Estimation Procedure

Many economic time series clearly display trends and seasonal elements with some also exhibiting common features over time. However, it has only recently been recognized that time series econometricians have formalized in econometric models the concept of common co-movements at particular frequencies, as well as the idea that common factors may influence the trend of some macroeconomic variables. Nevertheless, the statistical underpinnings of time series analysis require data to be stationary. For this purpose, we use the Phillip-Perron (PP) test to check for unit root problem.

If there is a trend between two variables, they will move together in achieving a long-term equilibrium. Many series, which separately are non-stationary, when joined together linearly have a long-term equilibrium relationship (Engle and Granger, 1987). We use the autoregressive distributed lag (ARDL) approach to cointegration (see Pesaran *et al.*, 2001) rather than some of the other approaches such as Johansen and Juselius (1990), as it has good small sample properties in comparison to these techniques, as well as circumventing the problem of the order of integration of the individual variables. The ARDL approach to cointegration (see Pesaran *et al.*, 2001) involves estimating the following conditional error correction version of the ARDL model:

$$\begin{aligned} \Delta \ln EX_t = & \beta_0 + \beta_1 \ln EX_{t-1} + \beta_2 \ln Y_{t-1} + \beta_3 \ln FY_{t-1} + \beta_4 \ln ER_{t-1} + \beta_5 ERV_{t-1} + \beta_6 RI_{t-1} \\ & + \sum_{i=1}^p \alpha_{1i} \Delta \ln EX_{t-i} + \sum_{i=0}^q \alpha_{2i} \Delta \ln Y_{t-i} + \sum_{i=0}^r \alpha_{3i} \Delta \ln FY_{t-i} \\ & + \sum_{i=0}^s \alpha_{4i} \Delta \ln ER_{t-i} + \sum_{i=0}^v \alpha_{5i} \Delta ERV_{t-i} + \varepsilon_t \end{aligned} \quad (4)$$

The long-run coefficients and error correction model are estimated by the ARDL approach to cointegration, where the conditional ECM is estimated using OLS and the lag structure for the ARDL specification of the short-run dynamics is determined by the Schwarz-Bayesian criteria, whilst testing to ensure there is no problem with autocorrelation. The bound cointegrating test is conducted by imposing a zero restriction on the long-run variables such as:

$H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$ versus $H_1 : \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$

If the calculated F-statistic is larger the upper bound value of Pesaran et al. (2001), we conclude that all variables are cointegrated, and vice versa. This study started from the basis that there are at least three lags present in the ARDL model.

Annual data from the 1970 to the 2004 period is utilized, which was collected from Penn World Table Version 6.2 (Heston et al., 2006), International Financial Statistics (IMF, 2006), Turkish Statistical Institute (2007), Key Economic Indicators (Asian Development Bank, 2006) and World Development Indicator (World Bank, 2006). For the Turkish Statistical Institute, the data can be extracted from the following website – http://www.die.gov.tr/ENGLISH/kit_ing_1.pdf. However, the publication year is not mentioned and therefore, year 2007 stated here is referring to downloading year of the publication.

5. RESULTS AND INTERPRETATION

First of all, we derived the conditional variance based on the GARCH (1, 1) model and the estimated values that were then used as a proxy for exchange rate volatility. The estimated coefficients of ARCH (ε_{t-i}^2) and GARCH (h_{t-i}) were found to be statistically significant, at least at the 10 percent critical value, implying the presence of ARCH and GARCH effects throughout the sample period. The results are available upon request.

Table 3: Philip-Perron (PP) Unit Root Test Results

	Level		1st Difference	
	C	C & T	C	C & T
Malaysia				
lnEX	-1.16	-1.27	-4.22***	-5.74***
lnY	-1.02	-1.48	-3.42***	-5.92***
lnFY	-1.33	-1.37	-4.00***	-4.97***
lnER	-1.29	-1.66	-6.27***	-6.94***
ERV	-3.22***	-4.11***	-7.80***	-9.86***
Turkey				
lnEX	-0.53	-1.66	-6.67***	-6.60***
lnY	-2.48	-2.69	-6.64***	-6.75***
lnFY	-1.33	-1.38	-4.00***	-5.77***
lnER	-0.59	-0.97	-4.36***	-7.52***
ERV	-3.06***	-4.08***	-10.29***	-10.79***

Note: Asterisk *** denotes significant at least at 10% level. H_0 = unit root.

Table 4: Cointegration Bound Results

F-statistics	MALAYSIA	TURKEY
		8.1164***
Critical value	Lower bound	Upper bound
1 %	3.15	4.43
5 %	2.45	3.61
10 %	2.12	3.23

Note: Asterisk * denotes significant at 1 %. Critical values are derived from Pesaran et al. (2001), Table CI (iii) case III: unrestricted intercept and no trend.

With at most I(1) variable, we satisfy the condition to conduct the ARDL cointegration test in investigating the long-run relationship between exports and several of its determinants. In Table 4, for both economies, the estimated F-values are larger than the upper bound of the test statistics. Therefore, we conclude that there exists a single cointegrating vector in all cases.

In the next step, we tested the existence of unit root in each series. The results of unit root test are given in Table 3 by using the Phillip-Perron (PP) test. Generally, for the level test, the absolute value of test

statistics are smaller than the absolute critical value of MacKinnon, suggesting that the null hypothesis of unit root cannot be rejected in all series except for *ERV*. However, at first difference, all of them are stationary. Therefore, we conclude that none of the series has a consistent integration order. Since the series have a mixed integration order, $I(0)$ or $I(1)$, the series can be further tested for the existence of long-run relationship or cointegration among the variables.

Having established all the necessary conditions, we now move on to the results of the long-run equation, which is presented in Table 5. First of all, the impact of domestic income seems to be significant as well as positive in both countries. This might be partly reflected in higher domestic investment with a particular emphasis given to providing better infrastructure (such as ports) for trade as well as in promoting technology development via human capital development and technology infrastructure. The latter effort could have a direct impact on export competency as it helps in enhancing the national productivity and subsequently export competitiveness. Alternatively, if the GDP represents domestic market size, it could also be interpreted that the small domestic market has forced domestic producers to sell their product abroad. This incentive can be considered as a pull factor of exports.

Table 5: Error Correction Models (ECMS), Long-Run Equation and Diagnostic Tests
Error correction models (ECMs)

Malaysia:

$$\Delta \ln EX = -0.5784 \text{ECT}(-1)^{**} + 3.4196 \Delta \ln EX(-1)^{***} + 0.1351 \Delta \ln Y + 1.9407 \Delta \ln FY^{***} - 1.2788 \Delta \ln ER - 2.7946 \Delta ERV - 6.9777 \Delta \ln EX(-2)^* + 4.0508 \Delta \ln Y(-1)^* + 1.9443 \Delta \ln FY(-1) + 0.3386 \Delta \ln ER(-1) + 1.3232 \Delta ERV(-1)^{***} + 2.5711 \Delta \ln FY(-1) - 1.0540 \Delta \ln ER(-2) - 3.3412 \Delta ERV(-2)^*$$

$$R^2 = 0.5561$$

$$\text{S.E. of Reg} = 0.0861$$

$$\text{AIC} = -2.5791$$

Turkey:

$$\Delta \ln EX = -0.0041 \text{ECT}(-1)^{***} + 0.0064 \Delta \ln Y^{***} + 0.0026 \Delta \ln FY + 0.0136 \Delta ERV^{***} + 0.6396 \Delta \ln EX(-2) - 2.0022 \Delta \ln Y(-1)^* - 1.0925 \Delta \ln ER(-1) + 1.0542 \Delta ERV(-1)^{**} + 0.7156 \Delta \ln EX(-3)^{**} - 0.0152 \Delta \ln Y(-2) + 1.9730 \Delta \ln FY(-2)^{**} - 5.3363 \Delta \ln ER(-2) + 3.7568 \Delta ERV(-2)$$

$$R^2 = 0.6627$$

$$\text{S.E. of Reg} = 0.1238$$

$$\text{AIC} = -1.6589$$

Long-run equation

Malaysia:

$$\ln EX = 11.2817^* + 0.6248 \ln Y^{***} + 0.8349 \ln FY^{**} + 0.0040 \ln ER^* - 0.1138 ERV^{***} + 0.0029 R^I^*$$

[1.8923] [4.1277] [2.8850] [2.6079] [6.4661] [2.6403]

Turkey:

$$\ln EX = -6.3449^* + 0.4316 \ln Y^{***} + 0.4671 \ln FY^{**} + 0.0099 \ln ER^* - 0.0738 ERV + 0.0068 R^I^{***}$$

[10.3564] [6.1647] [2.6899] [2.3469] [1.7110] [4.6471]

Diagnostic tests for ECMs

	<i>Malaysia</i>	<i>Turkey</i>
Normality	1.1734 {0.5562}	0.9609 {0.6185}
Serial Correlation	0.5072 {0.6809}	0.1285 {0.9421}
Heterogeneity	0.6142 {0.1253}	1.5386 {0.2272}

Note: ^a Jarqua-Bera is the test for the normality. Serial Correlation LM Test is the test for autoregressive. The White Test is the test statistic for possible heteroscedasticity. The CUSUM test, tests for functional form, but is omitted in this study due to space constraints. It is available upon request. Asterisks *, ** and *** denote significant at 10%, 5% and 1%, respectively. Figure in () stand for no of lag, figure in [] denotes t-value and figure in { } shows p-value.

Similarly, as anticipated, world income (*FY*) has a positive impact on exports. However, both economies' exports respond relatively inelastically, albeit positively, to any change in *FY*. In particular, the inelastic

response of Turkey's exports to a change in FY is not really surprising and well explained by the facts presented in Table 2. As far as Table 2 is concerned, no sign of improvement could be found in terms of demand for exports from Turkey from 1992 to 2004. Thus, the pressing issue facing Turkey right now is to find a way to improve the level of exports after inclusion into the EU. However, Malaysia's exports seemed to be more sensitive to changes in world income than in the case of Turkey. Again, this finding is in line with the observations found in Table 1 where the ratio of dependence on developed markets is growing over time and, therefore, its exports are largely subject to a change in world income. Although this statement may sound unrelated to the issue in hand it is, albeit, indirectly. Based on Table 4 of Tham (2004), we can see that Malaysia has undergone a very fast movement towards outward-oriented industry. The value of manufacturing exports (as percent of total exports) has grown tremendously from merely 11.9 percent in 1970 to 62.8 percent in 1990 and further increased to 86.6 percent in 2000. In other words, these growing exports are mainly targeting developed markets. Any sluggishness in the demand from these markets will definitely affect the sector and the country as a whole.

The role of exchange rate is as expected. The positive sign indicates that if the currency is strengthening relative to foreign currency, the demand for the exports will be dropped and vice versa. As mentioned earlier, although the size of the estimated coefficient is low and considering the concern is more on the volatility aspect of exchange rate, the inclusion of exchange rate variable serves as a control variable to avoid measurement bias.

Finally, the estimated coefficient of *ERV* shows that it has a negative impact on exports in both economies. This implies that producers in Malaysia and Turkey are generally risk-averse. An increase in exchange rate volatility will increase the desire to sell their goods domestically rather than in the foreign markets, attempting to avoid uncertainty in return. Therefore, exports will be adversely affected. However, the effect of *ERV* on *EX* in the case of Turkey is no longer significant after the inclusion of *RI*. This finding could be supported by the fact that in order to join the EU and, subsequently, the European Monetary Union (EMU), Turkey has to fulfil several Maastricht criteria (EC, 1992) and one of them is the requirement of the member to have a narrow band of fluctuation in the Exchange Rate Mechanism (ERM) for at least two years. Referring to Table 2, it is obvious that the performance of exports has nothing to do with exchange rate volatility as the level was maintained for the period, before and after Turkey's accession into EU under the customs union agreement. This point is also fully supported by the fact that the estimated impact of the *EU* (or regional economic integration) on Turkey's exports, albeit positive, is barely significant. A similar conclusion could be reached for the impact of *AFTA* on Malaysian exports.

5. CONCLUSION

Using annual data (1970 - 2004), this paper re-examined the main hypothesis that *ERV* may dampen exports in Malaysia and Turkey, while investigating the role of regional integration as an additional means of boosting export activities. The empirical evidence from this study suggests that exchange rate volatility has the ability to exert a negative influence on the demand for exports in Malaysia and Turkey. However, the impact is no longer significant when the role of regional economic integration is included in the case of Turkey. Therefore, the importance of regional economic integration as a means for future development is undeniable.

Although the impact of regional economic integration is minimal in both countries, it is important to note the issue surrounding this point. In the case of Turkey, the minimal impact is probably because Turkey is in the process of becoming a full member of the EU. At the moment, the agreement connecting Turkey with the EU is a customs union agreement. The EU bid only started in October 2005 and is expected to be a protracted process before it can be materialized. In contrast, unlike Turkey, Malaysia is already a member of ASEAN and AFTA. The issue facing ASEAN is that no impressive progress can be seen so far and the minimal impact could stem from the fact that AFTA is not yet a fully fledged free trade area. Therefore, as part of the efforts to preserve demand for exports, ASEAN countries should strengthen regional cooperation by elevating the level of intra-regional trade. Enlarging the regional cooperation to encompass large economic powers such as China, Korea and Japan could be another avenue to consider.

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