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Dynamic Relationship Between Trade Balance and Macroeconomic Elements: Empirical Evidence From Emerging Economies in Malaysia

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Abstract: ***Malaysia is very much dependent on foreign trade. As such it is critical to study the determinants of trade balance in Malaysia in order to improve trade balance and in turn, stabilize economy. Exports is one of the most important elements that drive Malaysia's GDP ver the years. This study investigates the relationship of trade balance with other macroeconomic elements such as domestic income, exchange rates, inflation rates and money supply, covering a time span of 15 years from 2000 to 2015. This paper employs Autoregressive Distributed Lag (ARDL) model to examine the short run and the long run relationship between trade balance and other elements. Granger Causality also performed to investigate the relationship between the variables. The results indicate that domestic income, inflation rates and exchange rates appear to be significant that affect the trade balance while money supply turn out to be affecting the trade balance insignificantly. Future researchers can use other econometric measuring techniques such as Vector Error Correction or Ordinary Least Square method to investigate the relationship between macroeconomics with trade balance. Moreover, future research is also suggested to include other variables such as foreign income, government expenditure, and household consumption to explore more on the determinants of trade balance and produced a more refined result.***

Keywords: ***Trade Balance, Malaysia, Autoregressive Distributed Lag (ARDL)***

I. INTRODUCTION

Malaysia is an open economy that depends on external trade in order to achieve economic growth (Yusoff, 2009). Malaysia has been growing rapidly and merchandise trade contributes significantly to this. Al-Yousif (1999) found that economic growth in Malaysia is driven by exports and Choong et al. (2003) implied that increase in exports would improve economic growth. The major exports are electrical and electronic products, chemical and chemical products, petroleum products, palm oil, rubber products, and machinery, equipment and parts. External trade plays a significant role in the Gross Domestic Product (GDP) in Malaysia and has been a catalyst to the development of the country's economy. The merchandise trade has grown tremendously in percentage of GDP from 1972 to 2000. The total merchandise trade grows from 66.1% in 1972 to 144% in 1995.

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Then, it further increases and hit the highest of 192% in 2000. However, it is observed that the merchandise trade in Malaysia had experienced an unexpected decline in recent years.

Figure 1 Balance of Trade in Malaysia

Source: Department of Statistics, Malaysia

Figure 1 shows Malaysia Balance of Trade. As seen from the figure, Malaysia has been reporting consistent trade surplus since 1998. This indicates that international trade plays a significant role in the Malaysia economy. This is mainly driven by the rise in exports of electrical and electronics product. The major trade surplus in Malaysia came from the trade with Hong Kong, Singapore, Japan and United States. However, the largest trade deficits are with China and Taiwan. Aruna (2016) reported that China's slowdown continues hurting Malaysian exports. The exports to China have fallen 22.3% in 2016.

Meanwhile, Malaysia is very much dependent on foreign trade in order to meet the economic development goals. Exports is one of the most important factors that drive Malaysia's GDP over the years. The exports in Malaysia show an upward trend throughout the years. Over 5 years, Malaysia has doubled its export from US$29.416 billion in 1990 to US$74.037 billion in 1995. The exports have an average of RM21285.92 million from 1970 to 2016, and reaching an all time high of RM75810.20 million in October of 2015 (Tradingeconomics.com, 2016). This indicates that foreign exports have become more significant. Hence, it is critical to study the determinants of trade balance in Malaysia in order to improve trade balance and in turn, stabilize economies. However, many studies suggested trade balance is largely influenced by the exchange rate (Baharumshah, 2001; Yusoff, 2009). Exchange Rate is one of the main factors that affect the trade balance.

This is because while trading with other countries, exchange rate measures the cost of Malaysia to import goods from foreign countries as well as the return gains from other country through exports.

Figure 1.2 MYR to USD Exchange Rate

Source: Department of Statistics, Malaysia

Figure 1.2 assists us to observe the fluctuation of the currency of Malaysia Ringgit to US Dollar. The fluctuation of the currency shows an uncertainty and this might be a concern to the foreign trade flows in the economies. However, Lieu, et al(2003) study on ASEAN-5 countries which include Malaysia have found that trade balance are affected by real money rather than exchange rates. It is said that the impact of exchange rate on the trade balance is exaggerated. Many studies have been done on the impact of exchange rates on trade balances. However, no consensus has been reached on this issue (Baharumshah, 2001; Wilson, 2001; Bahmani-Oskooee and Ratha, 2004; Yusoff, 2009). Studies found that the nominal depreciation or appreciation of the exchange rate has a direct effect on the trade balance (Himarios, 1989; Bahmani-Oskooee, 2001). However, there are also studies found weak evidence connecting exchange rate and trade balance (Rahman and Mustafa, 1996; Mahdavi and Sohrabian, 1993). Even though previous studies have applied different methodologies to investigate this issue, the empirical results from the studies are rather inconclusive. That also means no clear consequences have been pointed out regarding the factors that affect the trade balance in Malaysia. The controversy still existing on the direction in which the effect will occur. There are limited studies that investigate the determinants of trade balance in Malaysia.

This study also considers other variables, which are income, money supply and inflation rates. The consideration of these variables helps to provide more information to identify the determinants of trade balance in Malaysia. Aye Mengistu and Lee (2014) found that high inflations and lending interest rates give a negative impact on trade balance. This is because the high inflation rate is harmful to economic growth and trade balance as the cost of borrowings lowers the rate of capital investment. On the other hand, the high lending interest rate increases the cost of capital, in turn; discourage potential entrepreneurs to export goods. Besides this, money supplies have contributed a lot to the changes of real exchange rates. However, the changes of exchange rates do not give major impact on bilateral trade balances. Daniels and Vanhoose (2005) find that expenditure and income are the main determinants of the balance of payments in a country. The study of determinants of trade balance helps government to encourage trade balance with other countries. Trade deficit, also known as the balance of payments problem may lead to financial crisis. There is a need to investigate the determinants of trade balance in Malaysia so that the government could implement strategies accordingly to keep a stabilize economy.

II. LITERATURE REVIEW

There are various studies that have been conducted in analyzing the relationship between exchange rate and macroeconomic variables. Wilson (2001) examines the relationship between the real trade balance and the real exchange rate for bilateral trade in merchandise goods between Singapore, Korea and Malaysia and the USA and Japan. Quarterly data was used for the period between 1970 and 1996. The results suggest that the real exchange rate does not give an impact on the real trade balance excluding Korean trade with the USA. Besides, the findings also show that there is no J-curve phenomenon. Baharumshah (2001) examines the impact of the real effective exchange rates on the bilateral trade balances of Malaysia and Thailand with the USA and Japan for the period between 1980 and 1996. The findings support the traditional view that devaluation can affect the real variables and structure of the economy under the right circumstances. The depreciation of the real effective exchange rate will enhance and improve the trade balance of the country. According to the study, devaluation in Malaysia Ringgit will increase in competitiveness of its goods with foreign goods. However, the study also does not find evidence of J-curve phenomenon. The study also suggested real domestic income and foreign income as important variable that affects trade balance. Bahmani-Oskooee and Mitra (2008) examines the impact of exchange-rate volatility on the trade flows in Malaysia with U.S.

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Bounding test reveals that the exchange rate volatility has neither short-run nor long run effects on Malaysia's trade balance. This finding can be criticized that it suffers from aggregation bias. However, the study further disaggregates the trade balance between two countries including 101 U.S export industry to Malaysia and 17 U.S importing industries form Malaysia.

The result reveals that exchange rate volatility has short-run effects on majority of the industries. The finding is consistent with the finding of Bahmani-Oskooee and Ratha (2008). The majority of the industries that are affected by the exchange rates are found to be small industries. Also, the study found that exchange rates play an important role that affects the trade balance in majority of the industries.Onafowora (2003) provides a literature review of the effects of long run and short run of real exchange rate changes on the real trade balance of three ASEAN countries in the bilateral trade to US and Japan. The co-integration analysis shows a result that there is a long run steady state relationship between the real exchange rate, the real trade balance, the real domestic income and the real foreign income. The study also concludes that the Marshall-Lerner condition holds in the long run while having a varying degree of J-effects in the short run. It was found that the improvement of trade balance occurs 3 or 4 periods later after a real depreciation.

Liew, Lim and Hussain (2003) investigate the exchange rate and trade balance relationship in ASEAN Countries with Japan. The sample periods are from 1986 until 1999. It was found that the impact of exchange rate on trade balance has been exaggerated. It was expected that depreciation of ASEAN-5's currency to Japanese yen would improve the trade balance. However, the results show that devaluation-based adjustment policies may not achieve the desired result. That is being said, exchange rate cannot be used merely on managing external balance. The study proposed that the main factors affecting trade balance is real money, which is the ratio of nominal money to aggregate price level. Duasa (2007) examines the determinants of Malaysian Trade Balance by using Autoregressive Distributed Lag (ARDL) framework. The paper attempts to investigate the short and long run of relationship between trade balance, exchange rate, income and money supply. Income and money variables were used to test monetary and absorption approaches while exchange rate is used to test conventional approach of elasticity. It was found that there is long-run relationship between trade balance and income and money supply variables. However, the relationship absences in trade balance and real exchange rate. The Marshall-Lerner condition does not hold for long run in Malaysia. Malaysian trade balance was suggested to view from absorption and monetary approaches.Yusoff (2009) study the Malaysian bilateral exports and bilateral real exchange rates in Malaysia with United States, Japan and Singapore. The co-integration test was used to test the real exports, real exports, and foreign income and the findings show that they are correlated. According to the result of estimated long-run equations, the real exchange rates, foreign income as well as real imports are critical determinants that affect the trade balance. The major result of the study is that devaluation or depreciation in Malaysia Ringgit improves the competiveness of its exports.

As discussed above, there are various studies that investigate the impact of money supply on trade balance. Ardalan and College (2009) identify the seminal long-run empirical research on monetary approach to balance of payments. The study also uses other approaches such as elasticity and absorption approaches. The paper finds that monetary approach emphasizes on demand for and supply of money in the economy. It was concluded that money supplies contribute to major changes of exchange rates in the short run and monetary policy is very important in examining the trade balance.

III. METHOD & MATERIALS

This paper adopted positivist as key research instrument, which stresses on the importance of doing quantitative research. Positivist research heavily involve on quantifiable measures of variables and hypothesis generating to test the theory. The quarterly time series data are collected of all independent variables such as exchange rate, inflation rate, money supply and income. The data covers a period of 15 years, from 2000 to 2015. In this study, E-view is adopted as a tool to analyze the findings. It is statistical software that provides an easy-to-use object-oriented interface for.

Table 1.1 Sources of Data

Variables	Proxy	Units	Explanation	Data
Exchange Rate	EXC	RM/USD	Direct quote of Ringgit Malaysia per US Dollar.	Central Bank of Malaysia
Inflation Rate	CPI	Consumer Price Index	Consumer price index by taking the year 2010 as the base year.	Department of Statistics, Malaysia
Gross Domestic Product	GDP	USD Billion	GDP Malaysia.	World bank Bank Negara Malaysia
Money Supply	MS	RM Million	Money Circulation in Malaysia's market of Category 2.	World bank Bank Negara Malaysia

There are various methods to conduct cointegration test. The method that is widely used for cointegration test is the maximum likelihood based Johansen (1998), Residual based Engle-Granger (1987) test and the Johansen-Juselius (1990) test. However, it was reported by other researchers that there are some problems associated with these methods such as low power, thus failing to reject the null hypothesis of unit root (Shrestha, 2005).

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Due to this, the ARDL modelling popularized by Pesaran *et al.* (1999), Pesaran and Shin (1995, 1999), and Pesarans (1997) has been widely used to examine the relationship between trade balance and its determinants. The discussion of ARDL can be found in Duasa (2007). With the ARDL method, the dependent and explanatory variables are distinguished to avoid the potential endogeneity and serial correlation problem (Ahmed, Muzib and Roy, 2013).

Hence, the ARDL method is efficient and unbiased since endogeneity problems addressed. Moreover, the ARDL model allows different optimal lag orders for each variable while it is impossible for Johansen's VECM to have uneven lags. According to Pesaran and Shin (1999), appropriate modification of the orders of ARDL model is sufficient to simultaneously correct for residual serial correlation and problem of endogenous variables. Error correction model is an alternative way to acquire evidence for cointegration and determine if the short run adjustment of all variables are towards long-run equilibrium. The Error Correction Term (ECT) is known as the speed of adjustment parameter. It sows how much disequilibrium is being corrected. The ECT is derived from the residuals of estimated cointegration model of equation. The ARDL model and its associated ECM are estimated by OLS model (Nkoro and Uko, 2016).

The equation of ARDL approach to cointegration is stated as below:

$$\Delta \ln(X/M)_t = \alpha_0 + \sum_{i=1}^{p} \phi_i \Delta \ln(X/M)_{t-i} + \sum_{i=0}^{p} \theta_i \Delta \ln(REER)_{t-i} + \sum_{i=0}^{p} \lambda_i \Delta \ln(GDP)_{t-i}$$
$$+ \sum_{i=0}^{p} \varphi_i \Delta \ln(M3)_{t-i} + \delta_1 \ln(X/M)_{t-1} + \delta_2 \ln ER_{t-1} + \delta_3 \ln(GDP)_{t-1} + \delta_4 \ln(M3)_{t-1} + \upsilon_t \quad (1)$$

In (X/M) = trade balance
In (REER) = real exchange rates
In (GDP) = income
In (M3) = money supply

The ARDL specification of the short-run dynamics is derived by error correction model (ECM). It is written in the following form:

$$\Delta \ln(X/M)_t = \alpha_2 + \sum_{i=1}^{p} \phi_{2i} \Delta \ln(X/M)_{t-i} + \sum_{i=0}^{p} \theta_{2i} \Delta \ln(REER)_{t-i} + \sum_{i=0}^{p} \lambda_{2i} \Delta \ln(GDP)_{t-i} +$$
$$\sum_{i=0}^{p} \varphi_{2i} \Delta \ln(M3)_{t-i} + \psi ECM_{t-1} + \vartheta_t \quad (3)$$

When ECM gives a negative value, it shows that any short run deviation will converge towards long run equilibrium. In contrast, when ECM gives positive value, it indicates that the relationship between the variables is explosive and does not adjust towards long run equilibrium. Logging is recommended in ECM as it has greater effect on larger value and lesser effect on smaller values (Luneta, 2000). Besides this, calculating in log form allows for a direct estimation of elasticity from the various coefficients.

IV. DATA ANALYSIS

As the stationarity of time series data strongly influence its behavior, it is necessary to perform unit root tests. This study employed Augmented Dickey-Fuller and Phillips-Perron test to check whether or not unit root present in autoregressive model. The variables are tested at level form and first difference form. Table 1.3 shows the results of ADF and PP test in first difference form. It can be seen that majority of the series are stationary at 1% significant level. All of the series have reached stationary at first difference and hence, there is no need further testing at second difference form. Based on the results, it can be concluded that there are a mixture of I (0) and I(1) data. That means some of the variables are stationary at level form and some are stationary at first difference form. Since this inclusion, ARDL method is applicable as it fits the assumption.

Table 1.2 Unit Root Test at Level Form

Variables	ADF Test		PP Test	
	Without Trend	Trend	Without Trend	Trend
Trade Balance	0.1664	0.9740	0.1942	0.4834
GDP	0.9495	0.4231	0.9649	0.0005***
Inflation Rate	0.9890	0.1806	0.9954	0.1555
Exchange Rates	0.0000***	0.0002***	0.6548	0.6877
Money Supply	0.9381	0.4676	0.9359	0.3720

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Table 1.3 Unit Root Test at 1st Difference

Variables	ADF Test		PP Test	
	Without Trend	Trend	Without Trend	Trend
Trade Balance	0.0000***	0.0000***	0.0000***	0.0000***
GDP	0.0001***	0.0010***	0.0000***	0.0000***
Inflation Rate	0.0000***	0.0000***	0.0000***	0.0000***
Exchange Rates	0.1381	0.0578**	0.0000***	0.0000***
Money Supply	0.0000***	0.0000***	0.0000***	0.0000***

All of the data are transformed into natural logarithims form before conducting the test in order to squeeze the data and reduce dispersion. Before conducting ARDL bound testing and estimation of ARDL in long run form, diagnostic checking is performed to ensure the model is free from economic problems. The diagnostic tests include Autocorrelation test, Heteroscedasticity, normality test and model specification test.

Table 1.4 Summary of Diagnostic Checking

Tests	Results
Autocorrelation	
Breush-Godfrey Serial Correlation LM Test	Reject H0. Results passed.
Correlogram and Q-Statistics	Reject H0. Results passed.
Heteroskedasticity Test	
Breusch-Pagan-Godfrey Test	Reject H0. Results passed.
White Test	Reject H0. Results passed.
Normality Test	
Jarque-Bera test	Reject H0. Results passed.
Model Specification Test	
Ramsey REST Test	Reject H0. Results passed.

The Serial Correlation LM test (0.1527), Breusch-Pagan-Godfrey Test (0.2719), White Test (0.2965) and Jarque-Bera Normality Test (0.762387) and RESET Ramsey (0.8304) has large P-value, which is more than the significant level at 5%. Hence, we do not reject null hypothesis. The model has no autocorrelation problem, no heteroskedasticity problem, no model misspecification bias, error term was normally distributed and is structural stable.

After the model is done with diagnostic checking, there is strong evidence that the model is free from economic problems. Hence, ARDL bound testing can be proceeded to examine the long run relationship between trade balance and the independent variables.

Test-Statistic	Value	k
F-Statistic	12.46996	4

As seen from the result of bound testing, the F-statistic is 12.47. The critical value of lower bound I (0) is 2.2 and critical value of upper bound I (1) is 3.09 at significant level of 10%. At significant level of 5%, the critical value of lower bound I (1) is 2.58 and upper bound is 3.49. The F-statistic is 12.47, which is greater than the upper critical value of 3.49 at 5% significant level. Hence, we reject null hypothesis. Conclusion can be drawn that the long run relationship exists between the series and trade balance.

Estimating Long Run Coefficients

Table 1.5 Long Run Coefficients

Variable	Coefficient	Std. Error	T-Statistic	Prob.
DLGDP	-8.396713	3.732922	-2.249368	0.0288**
DLCPI	17.439554	7.378027	2.363715	0.0219**
DLEXC	-18.121644	3.725726	-4.863923	0.0000***
DLM3	-1.317245	1.456841	-0.904179	0.3702

Note: They symbol ***, ** and * refers to the rejection of null hypothesis at significant level 1%, 5% and 10% respectively.

Table 1.6 Summary Long Run Coefficients

Variable	Coefficient	T-Statistic	Conclusion
DLGDP	-8.396713	-2.249368**	Co-integration
DLCPI	17.439554	2.363715**	Co-integration
DLEXC	-18.121644	-4.863923***	Co-integration
DLM3	-1.317245	-0.904179	No Co-integration

The equation for this model can be written as bellow:

Cointeq= LTRADE – (-8.3967*LGDP +
17.4396*LCPI - 18.1216*LEXC - 1.3172*LM3
+ 66.8091)

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As seen from Table 1.5, all variables are statically significant to affect trade balance in long run except money supply. The results illustrate that income, exchange rates and money supply have negative impact to the trade balance while inflation rates has positive impact in long run.

Estimating Short Run Coefficients

Table 1.7 Short Run Coefficients

Cointegrating Form				
Variable	Coefficient	Std. Error	T-Statistic	Prob.
DLGDP	3.730865	1.049952	3.553369	0.0008***
DLCPI	10.213145	4.255576	2.399944	0.0201**
DLEXC	-6.033379	3.604752	3.604752	0.1003*
DLM3	-0.896778	0.818960	-1.095021	0.2787
CointEq(-1)	-0.434128	0.118056	-3.677319	0.0006***

Error correction model is an alternative way to acquire evidence for cointegration and determine if the short run adjustment of all variables are towards long-run equilibrium. The Error Correction Term (ECT) is known as the speed of adjustment parameter. It shows how much disequilibrium is being corrected. The ECT is derived from the residuals of estimated cointegration model of equation. The ARDL model and its associated ECM are estimated by OLS model (Nkoro and Uko, 2016).

Selection of Lags:

Table 1.8 Optimal Lag Length

Optimal Lag Lengths	Akaike Info Criterion (AIC)	Schewarz Criterion (SIC)
6 lags	0.845842	2.136190
4 lags	0.601616	1.516141
2 lags	0.488906	1.042578

In order to select how many lags to be used in equation, the most common selection criteria such as Akaike Info

Criterion (AIC) and Schewarz Criterion (SIC) are used. Table 1.8 shows the results of AIC and SIC that are tested with different optimal lag length. The lag length with lowest value is preferred in order to minimize the prediction error (Akaike, 1973). Based on the results, lag 2 has the lowest value of AIC and SIC. Hence, lag 2 is chosen as the best model.

Next, error correction model (ECM) is applied. The lagged OLS residuals are served as the error correction term in the ECM. The estimated equation is stated as below:

$$DLTRADE = -0.00766972320442 - 0.177*D(LTRADE(-2)) + 0.062*D(LGDP(-1)) - 0.0424*D(LGDP(-2)) + 0.048*D(LCPI(-1)) + 1.258*D(LCPI(-2)) - 0.036*D(LM3(-1)) - 0.013*D(LM3(-2)) - 0.227*D(LEXC(-1)) - 0.222*D(LEXC(-2)) - 0.413*ECT(-1)$$

Table 1.9 Error Correction Model

Variable	Coefficient	Probability
C	-0.00767	0.2733
D (LTRADE (-2))	0	0.1861
D (LGDP (-1))	0.06271	0.5836
D (LGDP (-2))	-0.042472	0.7071
D (LCPI (-1))	0.048565	0.9404
D (LCPI (-2))	1.258794	0.0406
D (LM3 (-1))	-0.036051	0.7661
D (LM3 (-2))	-0.013103	0.9137
D (LEXC (-1))	-0.227211	0.6506
D (LEXC (-2))	-0.222605	0.6705
ECT (-1)	**-0.413799**	**0.0055****

Table 1.9 presents the results of error correction model for trade balance. The ECT (-1) is negative and significant at 1% level. According to Bahmani-Oskooee and Ardalani (2006), a negative and significant ECT (-1) can reflect cointegration among the variables. The significant ECT also provides evidence of causality in at least one direction. The speed of adjustment towards long run equilibrium is 41.38%. In other words, the system corrects its previous period disequilibrium at a speed of 41.38% per quarter to get back to the stable state. The result also confirms the long run relationship among the variables that they cause one another for each time series. Apart from this, diagnostic checking are performed to make sure there are no biases and economic problems in the model.

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V. DISCUSSION

The domestic income has significant impact on the trade balance. In long run, the estimated coefficient for GDP indicates a negative impact on trade balance. The findings also supported the Keynesian view that as domestic income rises, Malaysia's imports increases as the nation is spending more on goods and services, thus increases the imports due to higher demand, causing trade deficit. Baharumshah (2001) reveals that any income-reducing policy can help to reduce the trade deficit with US. However, the result is inconsistent with Ng (2008) who found positive sign whereby as domestic income increases, it will make the export increase and improve trade balance. The domestic income affect trade balance negatively in long run and positively in short run. The expected signs of the coefficient of GDP could be negative or positive. As domestic income rises, the residents in Malaysia have higher demand on goods and service, thus increases imports, causing the trade balance to deteriorate. However, the domestic residents must exchange the domestic currency for foreign currencies in order to purchase the imports and therefore the domestic currency tends to depreciate (Onafowora, 2003). Generally, a weaker currency will stimulate exports, in turn improving the trade balance.

However, based on the empirical results, the relationship between inflation rate and trade balance are expected to be negative. This is inconsistent with our findings. Aye Mengistu and Lee (2014) found that high inflation rate is harmful to the economic growth. The inflation rate increases the cost of borrowing due to a higher interest rate. This in turn discourages potential investors from undertaking exports activities. The results supported by Ademe (2016) confirmed negative relationship between inflation rates and trade balance. The price hike tends to reduce demand of foreigners on domestic goods as cost increases and affect trade balance negatively.

According to the empirical results, currency devaluation is expected to improve trade balance. As home currency devaluates, it increases domestic competitiveness by decreasing the relative price of home goods, hence improving trade deficit. The absorption approach suggested that with currency devaluation, the domestic goods and services become more attractive as compared to foreign goods. In the mean time, the devaluation gives immediate effect on price of foreign goods. It decreases the domestic demand on foreign goods and foreign currency due to the price change. Since this inclusion, the demand is shifted towards the home country and imports are reduced accordingly. Currency depreciation improves trade volume of exports to other countries at the same time decreases the trade volume of imports from foreign countries, hence improve trade balance (Jha, 2003). The results also supported by Ogutu (2014), which shows that devaluation can improve trade balance. However, the study finds no effect of exchange rate on trade balance in long run. Hence, the absorption approach does not hold in the study. On the other hand, the results are contradicts with Bahmani-Oskooee *et al.* (2005), which found devaluation can improve trade balance in long run but short run effect may be different. It was said that trade balance will deteriorate first and get better after some time. The result is consistent with Bahmani-Oskooee and Ratha (2007).

Since our results are not supported by empirical studies, the study further tested the relationship between variables by using Granger Causality. According to the result of Granger Casuality, the inflation rates do granger cause GDP in Malaysia. As the inflation rates have a positive relationship with trade balance, it may give an impact on GDP, which in turn affect the trade balance. There is a negative relationship between inflation rates and trade balance. The GDP will fall relative with inflation rates caused by increase of food price (Moorthy & Kolhar, 2001). Armesh et al (2010) also supports that inflation rates has a negative relationship with GDP. When the inflation rate is low, it indicates a stable economy hence resulting a higher GDP. The domestic residents with higher income tend to buy more imported goods and services and deteriorating the trade balance. This explained the negative positive relationship between inflation rates and trade balance. The monetary approach states that difference between money demanded and money supplied in a country will affect exchange rate, which in turn gives impact on trade balance (Ivrendi and Guloglu, 2010). The monetary approach suggested that fall in money supply can improve trade balance (Duasa, 2007). According to the results of Granger Casuality, the money supply does granger cause exchange rate, confirming the relationship between money supply and exchange rate. The result follows the monetary approach. Furthermore, Bahmani-Oskooee and Ratha (2004) also reveals that changes in money supply affect exchange rates significantly. As money supply increases, the domestic residents will spend their cash balances on buying more imports, and consequently result in trade deficit. On the other hand, decreases in money supply would reduce trade deficit as the demand on imports decreases. Apart from that, the results show the coefficient of domestic money supply variable is statistically insignificant. This implies that changes of money supply in Malaysia do not give impact to trade balance. Hence, it is ineffective if the government adopt the monetary policy to improve trade balance. Conversely, Wong (2010) found that money supply is an important determinant of trade balance and that it affects trade balance in Malaysia significantly. The study suggests monetary policy as an important option for Malaysia in order to maintain price stability and in turn, improve trade balance.

VI. CONCLUSION

In this paper, the factors affecting the trade balance in Malaysia are analyzed. The variables that appear to affect trade balance significantly are domestic income, inflation rates and exchange rates. The results show that money supply is insignificant to trade balance in Malaysia. Hence, Malaysia should not focus on monetary approach to improve trade balance. Inflation rates have a positive relationship with the trade balance in both short run and long run, which indicates an increase in inflation rates lead improvement in the trade deficit.

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The results are not supported by past researches and further researches are required to confirm the relationship between inflation rates and the trade balance. On the other hand, exchange rates and money supply both affects trade balance negatively, indicating an increase of the variables will worsen the trade balance. Both of the variables have correct sign, but the money supply is insignificant. The results contradict with Wong (2010) who also investigates determinants of trade balance in Malaysia. However, the study found that money supply is a significant variable and that Malaysia should focus on monetary approach and maintain price stability and in turn improve trade balance. Since the results are rather inconclusive, future studies are encouraged to focus on money supply in examining determinants of trade balance. On the other hand, domestic income has negative and positive relationship with the trade balance in the long run and short run respectively. The results are supported by past researches, as the coefficient could be positive or negative.

REFERENCES

1. Ademe, A. (2016). Determinants of Ethiopian Trade Balance: Vector Error Correction Model (VECM) Approach. *Journal of Research in Business, Economics and Management*, 6(2), 858-867.
2. Akaike, H. (1973). Maximum Likelihood Identification of Gaussian Autoregressive Moving Average Models. Biometrika, 60(2), p.255.
3. Al-Yousif, Y. (1999). On the Role Exports in the Economic Growth of Malaysia: A Multivariate Analysis. *International Economic Journal*, *13*(3), 67-75.
4. Ardalan, K. and M. College, (2009). The monetary approach to balance of payments: A review of the seminal short-run empirical research. *Journal of Economics and Economic Education Research*,10(1), 47–99.
5. Aruna, P. (2016). China's slowdown to continue hurting Malaysian exports - Business News | *The Star Online*. *Thestar.com.my*. Retrieved 25 February 2017.
6. Aye Mengistu, A. and Lee, J. (2014). Examining the Effects of Currency Depreciation on Trade Balance in Selected Asian Economies. International Journal of Global Business, 7(1), 59-76.
7. Baharumshah, A. (2001). The Effect of Exchange Rate on Bilateral Trade Balance: New Evidence from Malaysia and Thailand. *Asian Economic Journal*, *15*(3), 291-312.
8. Bahmani-Oskooee and Mitra, (2008). Exchange rate volatility and industry trade between U.S and Malaysia. Science Direct.
9. Bahmani-Oskooee, M. (2001). Nominal and Real Exchange Rates of the Middle Eastern Countries and Their Trade Trade Performances. Applied Economics 33: 89{96.
10. Bahmani-Oskooee, M. and A. Ratha, (2008), Exchange rate sensitivity of US bilateral trade flows. Economic Systems, **32**, pp. 129–41.
11. Bahmani-Oskooee, M. and Ratha, A. (2008), Exchange rate sensitivity of US bilateral trade flows. *Economic Systems*, *32*(2), 129–141.
12. Bahmani-Oskooee, M. and Z. Ardalani. 2006. "Exchange Rate Sensitivity of U.S. Trade Flows: Evidence from Industry Data," *Southern Economic Journal*, 72(3), 542-559.
13. Choong, C.K., Yusop, Z., Law, S.H. and Liew, .K.S. (2003). Financial Development and Economic Growth in Malaysia: A Re-assessment from Bound Test Approach. *Labuan Bulletin of International Business and Finance*, *1*(1), 53-63.
14. Daniels, J. P. and D. VanHoose, (2005). International Monetary and Financial Economics, 3rd Edition. Thomson South-Western, Mason, Ohio, USA.
15. Duasa, J. (2007). Determinants of Malaysian Trade Balance: An ARDL Bound Testing Approach. *Global Economic Review*, *36*(1), 89-102.
16. Engle, R. F., and Granger C. W. J. (1987). Co-Integration and Error Correction: Representation, Estimation and Testing. Econometrica, 55, 251-276.
17. Eviews.com. (2017). EViews Help. [online] Available at: http://www.eviews.com/help/helpintro.html#page/content/testing-Residual_Diagnostics.html [Accessed 13 Jan. 2017].
18. Himarios, D. (1989). Do Devaluations Improve The Trade Balance? The Evidence Revisited. *Economic Inquiry*, *27*(1), 143-168.
19. Ivrendi, M. and B. Guloglu (2010). Monetary shocks, exchange rate and trade balance: Evidence from inflation targeting countries. Economic Modelling, 27, pp. 1144-55.
20. Johansen, D. (1998). Interface, Inc.: Taking the lead toward sustainability. Corporate Environmental Strategy, 5(3), pp.53-59.
21. Lieu, K., Lim, K. and Hussain, H. (2003). Exchange Rates and Trade Balance Relatinship: The Experience of ASEAN Countries. International Trade.
22. Lieu, K., Lim, K. and Hussain, H. (2003). Exchange Rates and Trade Balance Relatinship: The Experience of ASEAN Countries. International Trade.
23. Mahdavi, S. and Sohrabian, A. (1993). The exchange value of the dollar and the U.S. trade balance: An empirical investigation based on cointegradon and Granger causality tests. *The Quarterly Review of Economics and Finance*, *33*(4), 343-358.
24. Moorthy V. & Kolhar, S. (2011). Rising Food Inflation and India's Monetary Policy. Indian Growth and Development Review, Vol. 3 Issue: 1, pp. 73-94.
25. Nkoro, E. and Uko, K. (2016). Autoregressive Distributed Lag (ARDL) cointegration technique: application and interpretation. *Journal of Statistical and Ecnometric Methods*, *5*(4), 63-91.
26. Ogutu, G. (2014). Effects of The Real Exchange Rate on The Trade Balance in Kenya. International Institute of Social Studies.
27. Onafowora, Olugbenga, (2003). "Exchange rate and trade balance in east Asia: is there a J−curve?." *Economics Bulletin*, *5*(18), 1−13.
28. Pesaran, M. H., and Pesaran, B. (1997). Working with Microsoft 4.0: Interactive econometric analysis. London: *Oxford University Press*.
29. Pesaran, M., Shin, Y. and Smith, R. (1999). Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association*, *94*(446), 621-634.
30. Pesaran, M., Shin, Y. and Smith, R. (1999). Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. Journal of the American Statistical Association, 94(446), pp.621-634.
31. Piana, V. (2006). Trade Balance. [Online] Available at: http://www.economicswebinstitute.org/glossary/tradebalance.htm [Accessed 21 Sep. 2016]
32. Rahman, M. and Mustafa, M. (1996). The dancing of the real exchange rate of US dollar and the US real trade balance. *Applied Economics Letters*, *3*(12), 807-808.
33. Shrestha, M. B. (2005). ARDL Modelling Approach to Testing the Financial Liberalisation Hypothesis. University of Wollongong.
34. Wilson, P., (2001), Exchange rates and trade balance for dynamic Asian economies – Does the J-curve exist for Singapore, Malaysia and Korea? *Open Economies Review*,*12*(4), 389–413.
35. Wong, H. T, (2010). Bilateral Trade Balances: Evidence from Malaysia. Asian Economic Journal, Vol. 25 No. 2, 227-244.
36. Yusoff, M. (2009). Bilateral Trade Balance, Exchange Rates, and Income: Evidence from Malaysia. *Global Economy Journal*, *9*(4), 1-19.

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