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Export-Led Growth Theory: Malaysian Timber Industry

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ABSTRACT

Malaysia is one of the world's largest exporters of tropical timber and timber products with export destinations to 160 countries. In 2008, the timber industry was the fifth largest contributor with contribution of 3.3 percent to total export earnings of Malaysia. Among commodities, timber industry shared about 20.3 percent of the export earnings. The major exports of primary products are saw logs, sawn timber, fibre board and plywood. Secondary processed wood products are furniture, builders' joinery and carpentry together with mouldings. Given the contribution of Malaysian timber sector to Malaysian economy, this study sets to assess the experience of timber industry in Malaysia to provide support for export led growth (ELG) hypothesis. This study employs yearly data of real GDP and real export of timber products for the period 1979-2008 using Granger Causality approach. Cointegration test using Johansen approach evidenced the existence of long-run relationship between export and GDP of timber products. Furthermore, Granger causality proves that export led growth for Malaysian timber industry.

Keywords: Timber export, export-led growth, Granger causality, Malaysia.

1. INTRODUCTION

There is a wide discussion among the economist and policy makers on the relationship between exports and economic growth of a country (Izani, 2002; Afzal et.al. 2010, Ahmad Zainuddin, 1993; Choong et.al. 2005, Judith & William, 2000; Shirazi & Abdul Manaf, 2004). Various studies have also been conducted to empirically examine the hypothesis of export promotion strategies which leads acceleration of the economic growth. This theory later is known as the Export-led Growth (ELG) hypothesis.

ELG hypothesis identifies that the export is a major source of economic growth. This theory has received considerable attention and sparked the interest of

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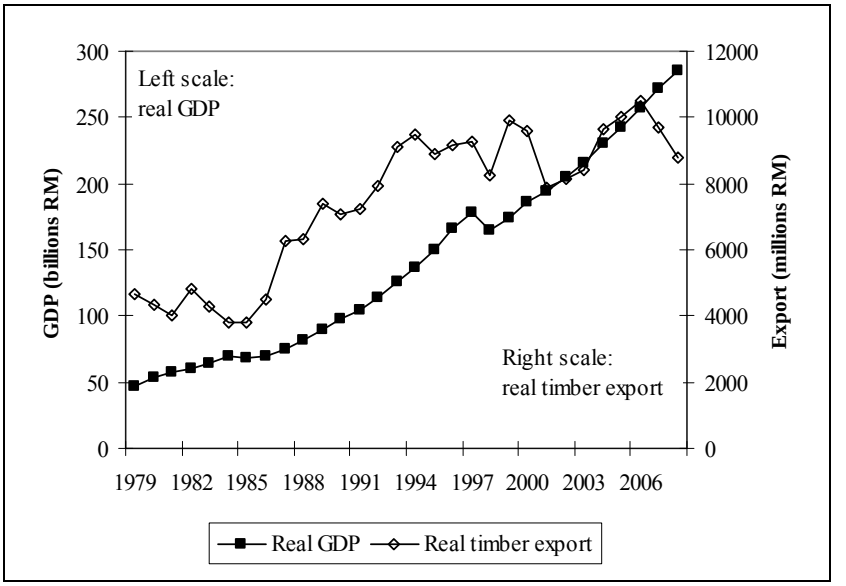
economists over decades with vast amount of literatures devote to analyze the relationship. According to Judith and William (2000) there are numbers of reasons to support the ELG in trade of a country. First, export growth represents an increase in demand for the country's output and thus serve to increase real output. Second, they proposed that the expansion in export may promote specialization in the production of export products which in turn may boost the productivity level and cause the general level of skills to rise in the export sector. Third, an increase in export may loosen the foreign exchange constraint which makes it easier to import inputs to meet domestic demand and enable output expansion. Furthermore, Smith (2001) presumes that overall growth of a country can be expanding through exports which considered being the engine of growth.

However, there is also potential for growth-driven export (GDE) hypothesis for a country. Lancaster (1980) and Krugman (1984) supposed that economic growth leads to enhancement of skills and technology which then increases efficiency and leads to comparative advantage of a country and industry. This hypothesis postulates that rapid growth direct to efficient allocation of resources due to comparative advantage and allows exploitation of economies of scale. Once the economies of scale are realized, the cost of exportable goods will decline and hence export will be more competitive in the world market (Ahmad Zainuddin, 1993). Yet, different impact of exports on economic growth across different countries and regions depend on level of development and economic structure and subject to a dynamic interactive process of economic development and structural change (Shirazi and Abdul Manaf, 2004).

1.1 Malaysian Timber Industry

Malaysia is one of the world's largest exporters of tropical timber and timber products with export destinations to 160 countries. In 2008, the timber industry was the fifth largest contributor with contribution of 3.3 percent to total export earnings of Malaysia. Among commodities, timber industry shared about 20.3 percent of the export earnings. The major exports of primary products are saw logs, sawn timber, fibre board and plywood. Secondary processed wood products are furniture, builders' joinery and carpentry together with mouldings.



Note: Timber exports excluded furniture
Source: Malaysian Economic Planning Unit and Maskayu Monthly Bulletin (2010)

Figure 1: Real GDP and real timber export for Malaysia, 1979-2008

Malaysia exports half of the timber products to Asian countries compared to other markets with dominant destination to China, Japan and Korea. The evolving of the wooden furniture, which is rubberwood-based products, has greater attention from manufacturers for the export market. It is remarkable that the export value of wooden furniture escalates rapidly after 1997.

Given the contribution of Malaysian timber sector to Malaysian economy, this study sets to assess the experience of timber industry in Malaysia to provide support for ELG hypothesis. This paper is organized as follows: introduction, literature review of ELG hypothesis for Malaysian context, Data and methodology which is based on the Granger causality approach, result and core findings of the analysis, and conclusion and policy implication.

2. LITERATURE REVIEW

There are numbers of studies attempts to empirically examine the ELG hypothesis for Malaysia. The evidence is however mixing. Ahmad Zainuddin (1993) investigates the export-growth relationship for the Malaysian agricultural sector using three-variable vector autoregressive (VAR) model for the period of 1960-1989. The model is subjected to three different causality test procedures:

Granger causality, Hsiao's technique and variance decomposition. The results indicate that growth of gross domestic products (GDP) causes exports in Hsiao technique and variance decomposition. However, Granger multivariate causality does not indicate any direction of causation. While Yousif (1999) studies on the role of exports in the economic growth of Malaysia from 1955-1996 using Vector Error Correction Model (VECM) and re-examine the relationship between exports and economic growth with additional relevant variables such as exchange rate, labour and capital. His result support the ELG hypothesis which real export tends to exert unidirectional impact on real output only in the short run. Over the long run, however, economic growth of Malaysia find to be GDE which exports tend to grow in response to a growing economy. The result found that the real GDP, labour, capital, exports and exchange rate are cointegrated and have a long run relationship for Malaysian case.

Choong et al. (2005) tested the validity of the ELG hypothesis using multivariate model in the Malaysian economy using ARDL (or bound testing approach) for the period of 1960-2001. A major finding of their study supports the hypothesis of ELG for Malaysian economy both in the short and long runs. The ARDL results also indicate that export and labour force have a positive impact on economic growth, while imports, exchange rate and the proxy of financial crisis have a negative effect on growth. Ku 'Azam (2006) identifies the relationship of export and overall economic growth of Malaysia from 1978-2002 and performed autoregressive-distributed lag (ARDL) cointegration test to establish the relationship between the variables. He found that the ELG hypothesis is valid for Malaysian case for the period under study. Interestingly, the study found that the manufacturing output plays a much significant role compared to primary output for economic growth of Malaysia.

Another study by Hooi and Smith (2010) analyze the causal relationship between the aggregate output, electricity consumption, exports, labour and capital in a multivariate model for Malaysia from 1971- 2006. They employed the Granger causality of modified version proposed by Toda and Yamamoto as well as Dolado and Lutkepohl. They found there is bidirectional Granger causality running between aggregate output and electricity consumption and that exports Granger causes aggregate output in the long run. In the short run, there is also bidirectional Granger causality between aggregate output and electricity consumption.

3. DATA AND METHODOLOGY

This study employs yearly data of real GDP and real export of timber products for the period 1979-2008. Though the export of timber products is officially documented since 1970s, due to inconsistency of data from the early date, official aggregate data can only be compiled from 1979 onwards. The data for all the variables are obtained from Malaysian Economic Planning Unit and Maskayu Monthly bulletin of major timber products from selected years. The GDP deflator (re-index, 1979 = 100) is utilized to deflate both variables. Both series of real GDP and real export are transformed to logarithm as it reduces the problem of heteroskecasticity and compresses the scale which variables are measured (Gujarati, 1995).

3.1 Unit Root Test

Prior to testing for a causal relationship between time series, stationarity of the variables should be determined. The aim is to verify the stationary trend of the time series. For this purpose, all the series are expressed in logarithm. The first step is to test the order of integration of the natural logarithm between the series. This can be done by computing the augmented Dickey-Fuller (ADF) test statistics to analyze the presence of unit roots for the time series data. If the variables found to be stationary, it is not necessary to proceed for cointegration test since classical regression methods of estimation such as Ordinary Least Square (OLS) are appropriate. If by contrast, the variables are non-stationary, the use of classical method of estimation could lead to spurious relationship and thus the result would be meaningless. A non-stationary time series can achieve stationarity if differenced appropriately. This appropriate number of differencing is called the order of integration. Hence a time series considered to be integrated of order d (contains d unit roots) if it becomes stationary after being differenced d times, denoted I(d).

3.2 Cointegration Test

Two time series *x* and *y* can be considered to be cointegrated if both time series are integrated at one, I (1). Cointegration regression demonstrates the long run relationship between the variables. Once the order of integration is determined, the cointegration of the variables is tested using Johansen approach. Furthermore, the Johansen cointegration test is based on vector autoregressive (VAR) specification and the optimal lag length of the VAR is determined using Akaike's Information Criterion (Leow, 2004). Gonzalo (1994) found that the Johansen approach has clearly better asymptotical properties to detect long run equilibrium than a range of other estimators. Specifically, he suggested that the Johansen procedures perform better than others even the errors are not normally distributed or when the dynamics are unknown. The Johansen procedures are based on two

statistical test; trace test (likelihood ratio test) and maximum Eigenvalue test. Under the trace test, the null hypothesis states that there are at most r (cointegration vector) where r = 0, 1..n-1. For maximum Eigenvalue test, the null hypothesis assumes there exist r against alternative hypothesis of r + 1 cointegrating vectors, where r = 1, 2…. n-1.

3.3 Granger Causality Test

If the series found cointegrated, then Engle and Granger (1987) proposed that causality must run in at least one direction of the variables. The direction of Granger-causality is detected through the vector error correction model (VECM) framework for long term cointegration equation. The results give the error correction estimation and error correction term (ect_{t-1}) from the cointegrating equation. The long term causality is indicated through the error correction term where a significant t-statistics shows the existence of long-term causality running from the independent variable to the dependent variables (Leow, 2004).

4. RESULTS AND DISCUSSION

Table 1 shows the result of ADF test statistics for unit root test. The ADF test reveals that the real GDP and real timber export have unit roots. We cannot reject the null hypothesis of unit roots even at 10% significance level. Although we employ the unit roots test with trend and intercept, we still cannot reject the null hypothesis of unit root. However, the result for the first difference indicate that all variables are integrated at order 1 i.e. I(1). Since the calculated Dickey-Fuller test statistic (-4.3757) for Real GDP is less than the 5% critical value, thus we reject the null of non-stationary. In other words, the variable d (GDP) = ΔGDP is stationary series. This means that after taken the first difference of the variables, there is no evidence of the existence of unit roots.

Table 1: Result of Unit Root Test

Variable	ADF			
	Level		1st difference	
	Intercept	Trend and intercept	Intercept	Trend and intercept
Real GDP	-1.2863	-4.2716	-4.3757**	-4.2716**
Real timber export	-1.2297	-4.7701	-4.7669**	-4.7701**

* indicate the statistical significance at 5% level

The Engle and Granger (1987) suggested that if the two series are integrated of order 1, granger causality must exist at least in one direction. Since the variables, are integrated at I(1), we will proceed with cointegration test using Johansen cointegration test. Cointegration is a regression of a unit root time series on another unit root series. It consist of matching up the degree of nonstationarity of the variables in an equation in a way that makes the residuals of the equation stationary and thus the result will be meaningful and not spurious. It means that, there are the variables are said to be cointegrated if they have long term equilibrium or relationship between them. Table 2 shows the result of Johansen cointegration test.

Table 2: Results of Johansen Test

Vector		Trace Statistics	Critical value	Max-Eigen value	Critical value	Results
Ho	H1		5%		5%	
r = 0	r > 0	11.60326	12.32090	11.40446	11.22480	Max eigen value test indicates 1 cointegrating equation at 5% level
r≤1	r>1	0.198803	4.129906	0.198803	4.129906	

Note: r stands for number of cointegrating vector

The results for cointegration test are reported in Table 2. The rank test indicates there is one significant cointegrating equation since the max Eigen value exceeds the critical value at 5%. In other words, there is cointegration between the series in the long run. In order to examine the causal relationship as well as the direction of the series, the Granger causality test was performed.

Table 3: Granger Causality Result

Direction of causality	F-statistics	Decision
Real export → Real GDP	9.64668	Reject
Real GDP → Real export	0.62374	Do not reject

* indicate the statistical significance at 5% level

The results suggest that the direction of causality is from real export to real GDP since we do reject the null hypothesis of real export does not granger cause real GDP at 5 percent level. On the other hand, there is no "reverse causation" from real GDP to real export since we do not reject the null.

4.1 Long Term Policy Implemented by Malaysian Government

From the above results, we found that real export of timber and real GDP are cointegrated and follow a common long run path. And the major finding is the timber industry has led the growth of GDP in Malaysia. This evidence supports the action of Malaysian government which aggressively concerned about the growth of timber industry in Malaysia for the long run. In February 2009, Malaysia had launched National Timber Industry Policy (NATIP) 2009-2020 to facilitate timber industry. The policy directions presented in NATIP are concerned with the long-term development of the timber industry. They are set out as a course of actions designed specifically for the industry to maintain and enhance its competitive edge in the global marketplace. In 2020, it is envisaged that the annual export of timber and timber products will reach RM53 billion, which is more than double the performance today (NATIP, 2009). NATIP contains 7 pillars that are instrumental for generating growth in the industry; which consists of industry structure, supply of raw materials, innovation and technology, marketing and promotion, human capital development, funding and incentives and Bumiputera participation.

The rapid growth of the timber industry has brought about new challenges relating to its future competitiveness and sustainability. To enhance the continued dynamism of the industry, the current structure of the timber industry needs to be restructured to meet the target of RM53 billion in annual export earnings by 2020. This evidence supports the findings done by Hooi and Smith (2010) that export cause output in the long run.

4.2 Incentives and Financing Assistance for Investment in Timber Industry

Traditionally, Malaysian timber industry has been dominated by the primary producing activities like sawntimber, plywood and veneer. Since the establishment of Industrial Master Plans (first industrial Master Plan in 1986), emphasized has been given to value-added activities for the secondary and tertiary processing. This was further emphasised by the implementation of policies that encouraged the development of downstream value-added manufacturing activities. To support the activities, tax incentives rebates and financial assistance were provided to attract potential investors (National Timber Industry Policy, 2009). Besides, the government also granted several financial incentives for small and medium (SME) timber companies to market and promote their products overseas and directly facilitate the expansion and growth of timber exports in Malaysia.

4.3 Emphasis on Research and Development (R&D)

The timber industry must undertake R&D in knowledge based manufacturing and Information Technology (IT) for the development of the industry. The continuing development of the industry will depend on its ability to develop and absorb technology and information flow. Besides, the existing collaboration and cooperation between Research Institutes, Research Universities and the industry to embark on R&D programmes and its commercialization to meet the requirements of the industry is very crucial. The government will undertake efforts through Forest Research Institute of Malaysia (FRIM), Rubber Research Institute of Malaysia (RRIM) or Malaysian Timber Industry Board (MTIB) among others to promote more R&D in exploring alternatives for the use of timber such as in the production of energy and biofuel.

5. LIMITATION OF STUDY

The analysis is done at aggregate level. Different products may have different importance over wide-range of time for timber industry. It should be noticed that this analysis exclude furniture industry as we chose only major timber exports reported by Maskayu Bulletin.

6. CONCLUSION

This study determines the relationship of the GDP and export of timber products on a bivariate basis. Cointegration test using Johansen approach evidenced the existence of long-run relationship between export and GDP of timber products. Furthermore, Granger causality proves that export led growth for Malaysian timber industry. Export-led growth emphasised in literature depends upon a number of factors: favourable geo-political and world conditions, political stability, peaceful law and order situation, highly developed infrastructure, productive manpower, price competitiveness, adequate access to important markets, high bargaining power in trade negotiations, low population growth rate, effective marketing, maintenance of quality standard , substantial research and development expenditure and others (Afzal and Hussain, 2004). There is major likelihood of managing the said factors effectively in Malaysia to enable the exports to increase to a level where they could contribute significantly to economic growth.

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