Concentration of Exports and Patterns of Trade: A Time-Series Evidence of Malaysia

Zarinah Hamid

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CONCENTRATION OF EXPORTS AND PATTERNS OF TRADE: A TIME-SERIES EVIDENCE OF MALAYSIA

Zarinah Hamid*
International Islamic University, Malaysia

ABSTRACT

This paper investigates the magnitude of geographic as well as commodity concentration for Malaysia from 1970 to 2003 and how the pattern of trade and instability has changed over time. The instability index is regressed upon a set of explanatory variables including commodity concentration, geographic concentration and share of primary commodity exports. The results indicate that the commodity concentration appears as a significant variable in explaining the export earnings instability. The paper recommends Malaysia takes several measures in order to remain immune from negative effects of instability. They include the continuous effort to stay competitive by maintaining productivity higher than production cost, to diversify as well as broaden its industrial base and constantly find new markets for new products.These measures, in the presence of right macro-economic policies supplemented by increasing foreign direct investment with intra-regional trade paved the way for market-friendly approach backed by a number of liberalization measures.

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Corresponding Author's Email Address: inahumkc@iiu.edu.my

INTRODUCTION

The Malaysian economy has shown to be one of the most dynamic economies in the Asia Pacific region. Since its independence in 1957, dramatic transformation and changes have taken place in the structure and profile of the Malaysian economy in the last five decades. Gradually over this period, it has displayed attributes of newly industrialized country and its economy has shown an impressive track record. In the 1970s, its annual growth rate reached 7.8% and continued to grow at a rate of 8.8% in the late 1980s except during the periods of deep recession in 1985 to 1986 where real GDP growth recorded a decline of 1.1% and 1.2%, respectively (Malaysia, 1986, p.39). The Malaysian economy managed to recover few years later and starting 1988 onwards it has sustained an annual growth of over 8%. In 1995 it has registered a growth of 8.5%. However, the financial crisis that hit Malaysia and other East Asian countries resulted in a negative growth of 7.5% in 1998. With various economic policy adjustments made in 1999 onwards, Malaysia was able to pull itself through the crisis and recorded a positive growth in seven consecutive years. After a strong take-off of 5.3% in 2003, the second half of 2006 recorded a higher than expected growth of 5.9% (Malaysia Economic Report, 2006, p.27). The economic

outlook for 2008 is promising and the economy is predicted to register robust growth with real GDP is expected to expand between 6.0 percent and 6.5 percent (Malaysia Economic Report, 2007, p.11). It is envisaged that Malaysia will reach the status of industrialized economy by the year 2020.

For a small and open economy as that of Malaysia, trade dependency is unavoidable. Trade dependency implying dependency on both exports and imports as a proportion of national income can be measured by the geographic as well as commodity concentration of exports and imports. While the geographic concentration measures the concentration of trade on limited trade partners i.e. countries, the commodity concentration measures the dependence on a few tradable commodities. It is often argued that lack of diversification of exports and limited trade partners contribute to export earnings instability. The objective of this paper is to investigate the extent of geographic as well as commodity concentration for Malaysia from 1970 to 2003 and how the pattern of trade and instability has changed over time.

The paper is structured as follows. The next section undertakes an evaluation on cross-sectional and time-series studies on several countries related to concentration and diversification of exports and instability of export earnings. Section 3 describes the data and model used in this study. Section 4 presents the empirical results and the last section concludes.

LITERATURE REVIEW

Although literature on geographic and commodity concentration in Malaysia and its implications for the overall stability of the economy is limited, various important studies have been undertaken in several countries from the perspective of a cross sectional analysis as well as a time series analysis.

Studies by Michaely (1958) on geographic concentration of exports and imports on 42 countries suggested two important observations:

i. There was a tendency of exports to be more geographically concentrated than imports. This phenomenon happened to countries in which the geographic concentration of foreign trade was high.
ii. Small countries[i] have higher geographic concentration coefficient than the large countries, this is true both for developed[ii] and underdeveloped countries.

Massell (1964) also came up with some interesting findings by concluding that there was a clear relationship between instability of export earnings and concentration of exports. But he stressed that "neither diversification nor the degree of industrialization appears to explain much of the variation in export instability", and elaborated further that "diversification may be beneficial in other ways, for example, in providing the economy with greater flexibility in adapting the structure of its production to changes in market conditions"(Massell, 1964, p.62). Another cross sectional analysis conducted by Soutar (1977) concluded that geographic concentration was one of the significant variables in explaining instability in 48 less developed countries from 1957 to 1969. Other significant explanatory variables that explained export instability were commodity concentration and petroleum product index. However, Malaysia was excluded in the sample used in this analysis. Perhaps the main reason Malaysia had to be dropped from the sample was due

to lack of data for the period of study. Macbean and Nguyen (1988) showed a summary of cross country results on effects of export instability on economic growth done by 13 authors. These results suggested that instability was an obstacle to growth, but the authors cautioned the readers on the causal relationship between growth and instability was sensitive to the samples of countries, periods of time series and the way in which the instability was measured. Love (1990) in his studies took a sample of 65 developing countries and compared the degrees of instability experiences by this group between the periods of 1960 to 1971 and 1972 to 1984. The results obtained indicated that instability increased between the two periods. It is important to note that Malaysia was one of the seven countries omitted in his studies due to increasing dependency on export revenues from oil.

In terms of time series analysis, Wilson (1994) investigated the export earnings instability of Singapore from 1957 to 1988. His findings revealed that there was a high level of instability in the mid 1960s due to political and economic uncertainty in Singapore and instability from 1972 to 1988 was due to shocks from the international economy. Nevertheless the problem of export fluctuations did not appear to be serious given her record of rapid development growth which had largely insulates her from the negative effects of instability. In a related work, Yeats (1998) reported that studies have shown that countries with highly concentrated exports may experience a relatively high degree of export earning instability that could reduce a country's ability to maintain the financial commitment required by regional arrangements.

It is generally agreed that countries specialize in a narrow group of export products exposed themselves to volatility or instability of export earnings (Samen, 2006). The experience of Least Developed Countries such as Bangladesh, Myanmar and Nepal which had adopted export-oriented policies in the late 1980s initially showed a rapid rate of export growth. However, due to the over-reliance on a narrow group of export products, these countries experienced a slower and even a declined rate of export growth (United Nations, 2004). The dismal performance of several Latin America countries in the 1980s which had implemented inward-oriented policies provided evidence that export diversification and economic development were related. However, Chile is an exception and at odds with the slow-growing Latin American economies. It has managed to mitigate the effects of instability and minimize the volatility of its exports portfolio by developing a relatively significant and more diversified export sector (Luders, 2006). According to Amin Gutiẽrrez de Piñeres and Ferrantino (1997), the main source of diversification in Chile has been the emergence of primary products industries under the inducement of real exchange rate depreciation. As a result, these diversified exports have become the engine of growth for Chile.

The commonly used method for measuring commodity concentration is based on the calculation of Gini coefficient and the modified version called Gini-Hirschman coefficient of concentration (United Nations, 2004; Samen, 2006). However, Low, Olarreaga and Suarez (1998) used three different concentration indices namely Herfindal-Hirschman concentration index, Theil-entropy coefficient and Mean Logarithm deviation to investigate if globalization has affected the concentration indices. Their findings indicated, among others, that although world trade has increased overtime, globalization does not affect the concentration indices. According to Kali, Mendez and Reyes (2007), empirical measures of trade characteristics or trade structures are limited. In analyzing

trade structure and economic growth, they used trade dispersion among trading partners as one of the measures of trade structure. As in Low, Olarreaga and Suarez (1998), Kali, Mendez and Reyes (2007) constructed a Herfindahl-Hirschman concentration index of trade for all countries to measure trade dispersion among all trading partners. The study found trade concentration to be positively correlated with growth for all countries, but the effect is found to be more pronounced for poor countries.

In a separate study, Ishido (2004) used a less rigorous method by applying the coefficient of variation as a proxy to measure manufacturing capability cum trade divergence in selected Asian economies. Ishido found that in these countries when more technology-enhancing economic activities were undertaken within an economy, export became more divergent. In order to access the possibility of future trade integration among seven South Asian countries, Pitigala (2005) investigated certain fundamental conditions (as defined by empirical evidence) as criterions for a successful trading bloc. Among the statistical measures used in his report is concentration of exports index. His study revealed that with the exception of India, the exports of most South Asian countries were highly concentrated and the prospects of increasing regional trade did not appear to be encouraging.

In line with Kali, Mendez and Reyes (2007), Pitigala (2005) and Low, Olarreaga and Suarez (1998), this study will focus on the export component of trade as means to measure commodity concentration and geographic concentration. The advantage of using these measurements is that they allow for product level as well as country-level examination which could be used to gauge the prospects for the possibility of Malaysia to reach the status of industrialized economy by the year 2020. Since there has been no such effort to investigate the economy at the disaggregated level, the findings of this paper would serve to provide useful information for the formulation of strategies which would enhance regional economic integration between Malaysia and its trading partners. The details of the measurements are described in the next section.

METHODOLOGY

Although official national accounts statistics for Malaysia were published in 1955, the data from 1955 to 1970 were not very useful as they were in two different series. Lim (1973) found that in the first series, for the period of 1955 to 1966, the data were subject to a considerable degree of error while in the second series, for the period of 1960 to 1970, he concluded that the data contained major revisions due to the acquisition of a more reliable and comprehensive set of data. Hence, acknowledging the obstacle encountered in the shortage of reliable data, the period of 1970 to 2003 was taken into consideration. The source of data for commodity exports in local currency (Malaysian Ringgit) was taken directly from Bank Negara (various issues), and International Trade Statistics Yearbook (various issues) whereas the source of data for geographic exports in US dollars was taken directly from International Monetary Fund, Direction of Trade Statistics (various issues).

As a measure of export concentration, two types of coefficients will be used; one for measuring commodity concentration and the other for geographical concentration of exports. The commonly used method for measuring commodity concentration is based on

the calculation of Gini coefficient and the modified version called Gini-Hirschman coefficient of concentration written as

$$C = \sqrt{\sum \left(x_{i,t} / X \right)^2} \qquad (1)$$

Where $x_{i,t}$ = the value of exports of a particular commodity *i* in a given year *t* and *X* =summation of export earning from the commodity under consideration (i.e. $\sum x_i$). The lowest possible value of C will equal to $\frac{100}{\sqrt{n}}$ where *n* represents the number of commodities. We use the disaggregated export data as classified by the Central Bank of Malaysia which consists of 13 non-manufactured (six major and seven minor products) and 15 manufactured commodities. In our case complete diversification will be $\frac{100}{\sqrt{28}}$ or 19 since 28 commodities are taken into consideration. On the other hand if a country's export consists of only one item, C will equal to $\frac{100}{\sqrt{1}}$ or 100 which implies complete concentration.

Export concentration was measured over three sub-periods; 1970 to 1985, 1986 to 1998 and 1999 to 2003. The cut-off points were chosen based on the structural breaks that took place in the Malaysian economy during these periods. Malaysia experienced a deep recession in 1985 and 1986 where real GDP growth recorded a decline of 1.1% and 1.2%, respectively (Malaysia, 1986, p.39). In 1998, the financial crisis that hit Malaysia and other East Asian countries resulted in a negative growth of 7.5%. The breaks for these time periods were also tested using Chow test. The test statistics for Chow breakpoint test confirmed a structural change in the parameters in these years. The F-statistics rejected the null hypothesis of no structural change for all models at the 5 percent level of significance.

Similarly the measure for geographic concentration is written as

$$G = \sqrt{\sum \left(Y_{i,t} / Y \right)^2} \qquad (2)$$

Where $Y_{i,t}$ = value of exports to country *i* in a given year *t* and *Y* = summation of exports to country *i* (i.e. $\sum Y_i$).

The cut-off point used by Pitigala (2005) to compute the concentration of exports index for seven South Asian countries is 75%. He defined the concentration of exports as the number of products accounted for 75% of total export growth of a country to the rest of the world at SITC 4-digit product classification. However, due to inaccessibility of data for Malaysia at this disaggregated level, we measure the concentration of exports differently. In our study, the geographic concentration index has been classified under three categories, namely 5 percent, 1 percent and 0.3 percent of exports. 5 percent of exports signify the countries where at least 5 percent of Malaysia exports are destined and similar definition applies to 1 percent and 0.3 percent. It is

important to note that the number of countries varies in the range of 3 to 5 under the first category (i.e. 5 percent), while in the case of second and third category (1 percent and 0.3 percent) the number lies in the range of 14 to 19 and 23 to 31, respectively. Therefore the value of the coefficients of geographic concentration showing complete diversification under the above stated three cases will be $\frac{100}{\sqrt{5}} = 45$, $\frac{100}{\sqrt{19}} = 23$, $\frac{100}{\sqrt{31}} = 18$ when the highest number in the range is used, respectively.

Besides using these two types of measurements i.e. commodity concentration and geographic concentration as the explanatory variables, this study adopts another explanatory variables namely the share of primary commodity exports (PCC) as its third explanatory variable. Meanwhile, the instability index is used as the dependent variable where it is defined as annual percentage rate of change in the value of exports. It is measured according to major (IMajor), non-manufactured (INManu), manufactured (IManu) and total (ITotal). The commodity concentration index is disaggregated into major (CMajor), non-manufacuted (CNManu), manufactured (CManu) and total (CTotal). This is done to identify the importance of a particular type of commodity concentration that is capable of explaining instability quite significantly. The geographic concentration is also measured at three levels; 5 percent, 1 percent and 0.3 percent as delineated above.

It is well documented that most economic time series data are nonstationary and the error terms are time-variant. Thus any empirical work based on time series data need to conduct a priori tests to evaluate the stationarity of the series, the order of integration, and the cointegration of two or more variables under consideration. Through our observation on the list of variables that we have, we anticipate that these variables are not integrated of the same order. Since the instability (I) index is defined as annual percentage rate of change in the value of exports, the series are normally stationary while other series in the model are non-stationary and contain unit root. This paper employs a cointegrating technique namely the Autoregressive Distributed Lag Model (ARDL) as introduced by Pesaran et al. (2001) which does not require pre-unit root testing. This procedure can be applied irrespective of whether the underlying regressors are I(1), I(0) or fractionally integrated and the long-run coefficient estimates are found to be consistent and asymptotically normally distributed. The ARDL has another advantage of yielding the optimal lag-length for each variable in which it estimates $(p+1)^k$ number of regressions, where p is the maximum lag to be used and k is the number of variables in the equation. In addition, the ARDL approach proves to perform well in a small sample size as in this study, hence the motivation to employ this technique is seen to be the most appropriate choice.

The ARDL model is assumed to take the following form

$$\Delta I_t = a_0 + \sum_{j=1}^{k1} b_j \Delta C_{t-j} + \sum_{j=0}^{k2} c_j \Delta PCC_{t-j} + \sum_{j=0}^{k3} d_j \Delta G_{t-j} + n_1 I_{t-1} + n_2 C_{t-1} + n_3 PCC_{t-1} + n_4 G_{t-1} + \xi_t$$

where I is the instability index for either major products (IMajor), non-manufactured products (INManu), manufactured products (IManu) or total products (ITotal); C is the

commodity concentration for either major products (CMajor), non-manufactured products (CNManu), manufactured products (CManu) or total products (CTotal); PCC is the share of primary commodity exports; and G is the geographic concentration at either 5% (GC5), 1% (GC1) or 0.3% (GC03). Thus, there are 12 models to be estimated where the abbreviation of the dependent and independent variables are given in Appendix 1.

ANALYSIS OF RESULTS AND DISCUSSION

It appears from Table 1 that the values for the commodity concentration have declined in which the overall coefficient is 45.34 for the period of 1970 to 2003. This decline in concentration speaks very favorably when these values are compared with export concentration of 78.4 for the year 1959 for Malaysia (Massel, 1964). The high value of commodity concentration coefficient reported by Massel reflects the heavy dependency of the economy on rubber and tin which together generated almost 75% of export earnings during this period. Realizing that the domestic economic performance was highly vulnerable and highly susceptible to international trade and instabilility, the government of Malaysia embarked on an agricultural-diversification and industrial-promotion program. Thus the decline shows the economy is moving from a nearly complete concentration scenario to a broader range of exportables or towards diversification. It appears also in Table 1 that the values for the commodity concentration coefficient have increased when the first period (1970 to 1985) is compared to second period (1986 to 1998) and third period (1999 to 2003) for both major and manufactured products. If we refer to equation 1, we can see that this increase is due to a bigger value of the radicand for the second and third period. This increase implies higher specialization and it gives a more realistic view of the current state of affairs of the economy.

TABLE 1. INTER-TEMPORAL COMPARISON OF COMMODITY CONCENTRATION BASED ON COMMODITY CLASSIFICATION 1970-2003

Commodities	Non-manufactured		Manufactured	Grand Total
	Major	Minor		
Period				
A. 1st Period (1970-1985)	47.53	51.58	44.58	36.99
B. 2nd Period (1986-1998)	49.14	NA	61.66	47.26
	(+3.39)		(+38.3)	
C. 3rd Period (1999-2003)	52.97	NA	70.33	63.44
	(+7.8)		(+1.8)	
D. Whole Period (1970-2003)	44.69	NA	55.33	45.34

Sources: Bank Negara Malaysia (various issues) and International Trade Statistics Yearbook (various issues).

Notes: Figures in parentheses against Row B are based on Row A. Figures in parentheses against Row C are based on Row B. NA – Not able to compute the commodity concentration index due to unavailability of data for minor commodities from 1995 onwards. A plus sign reflects an increase.

Furthermore when the commodities are highly aggregated into non-manufactured (including major and minor primary commodities) and manufactured, the

relative increase in concentration is higher in case of manufactured compared to non-manufactured commodities. It is observed that that there is an increase of 38.3 percent for manufactured commodities compared to only 3.39 percent for major commodities. The substantial increase in 15 manufactured commodities which consists of electrical machine appliance and electronics, transport equipment, food, beverage and tobacco, textiles clothing and footware, wood products, rubber products**,** paper and paper products, petroleum products, chemical and chemical products, non-metallic mineral products, manufactured of metal, optical and scientific equipment, toys and sporting goods, and others indirectly reflects the shift of Malaysian economy portfolio from non-manufactured products to manufactured products.

In the early 1970s the government created free-trade zones where participation of heavy multinational companies was observed in the manufacturing sector. This step has brought about significant changes in the share of manufactured exports as a percentage of total exports, where statistics has shown that it was doubled from 11.9% to 22.4%, with the export share of GDP remained high, and the average GDP growth rate rose from 6.5% to 8%. The "Look East" policy introduced by the government in the early 1980s with the objective of encouraging foreign investment and heavy industrial projects led to a strong surge in the imports of these expensive machinery and infrastructural equipment and soared the manufactured-export growth in the late 1980s (Doraisamy, 1996).

TABLE 2. INTER-TEMPORAL COMPARISON OF GEOGRAPHIC CONCENTRATION OF EXPORTS 1970-2003

	Value of Coefficient of Concentration with		
Period	5% of exports	1% of exports	0.3% of exports
A. 1st Period (1970-1985)	52.58	40.21	37.72
B. 2nd Period (1986-1998)	56.60	38.55	36.52
	(+7.6)	(-4.1)	(-3.2)
C. 3rd Period (1999-2003)	53.98	36.72	34.61
	(-4.63)	(-4.75)	(-5.23)
D. Whole Period (1970-2003)	54.36	38.96	36.71

Source: Direction of Trade Statistics (various issues).
Notes: The figures in parentheses against Row B are based on Row A, while those against Rows C are based on Row B. A plus sign reflects an increase while a minus sign reflects a decrease.

As for the geographic concentration, it appears in Table 2 when the first sub-period is compared to second sub-period, there is an increase of 7.6%, a decrease of 4.1% and a decrease of 3.2% at 5 percent, 1 percent and 0.3 percent levels of exports, respectively. The higher geographic concentration coefficient at 5 percent level of exports indicates that the ratio between value of exports and total exports to countries in this category has increased and directly implies the dependency of Malaysian exports on her major trade partners. However, there is a decrease in geographic concentration coefficient from 1986 to 1998 which reflects diversification at 1 percent and 0.3 percent levels of export destination. In addition, it seems that from 1999 to 2003 there is a decline in geographic concentration coefficient with 4.63%, 4.75% and 5.23% at 5 percent, 1 percent and 0.3 percent levels of exports, respectively (Row C). The decline suggests that the countries where at least 5 percent, 1 percent and 0.3 percent of Malaysian total

exports is destined is perhaps experiencing less economic growth and thus import less from Malaysia. The decline in geographic concentration may also suggest that Malaysia is diversifying her trade exports by having more trading partners.

As mentioned earlier, in time series data, for the least squares estimates to be reliable, the error terms must be stationary or time-invariant. Otherwise, the non-stationary series will build-up errors continuously that will tend towards an infinite variance. The OLS estimation will have spurious t-statistics and high R^2 even if the explanatory variables are not significantly related to the explained variable.

TABLE 3. UNIT ROOT TESTS 1970-2003

	Levels		First Difference		Order of
Variables	ADF	PP	ADF	PP	integration
IMajor	-5.6594***	-5.6555***			I(0)
INManu	-5.5955***	-5.5912***			I(0)
IManu	-4.4955***	-4.5085***			I(0)
ITotal	-2.4924***	-6.0536***			I(0)
PCC	-0.9917	-1.2488	-0.6138	-4.3018***	I(1)
GC5	-3.2994*	-3.3632*			I(0)
GC1	-2.8324	-2.8341	-7.0446***	-7.1146***	I(1)
GC03	-1.7167	-1.7909	-5.0524***	-5.0247***	I(1)
CMajor	-2.2978	-2.2213	-6.2064***	-6.2913***	I(1)
CNManu	-3.3941*	-2.7905			I(0)
CManu	-2.04397	-1.6381	-3.8127**	-3.7491**	I(1)
CTotal	-1.8663	-2.0006	-3.2714*	-3.2749*	I(1)

Notes: IMajor = instability index for major products; INManu = instability index for non-manufactured products; IManu = instability index for manufactured products; ITotal = instability index for total products; PCC = share of primary commodity exports; GC5 = geographic concentration at 5%; GC1 = geographic concentration at 1 %; GC03 = geographic concentration at 0.3%; CMajor = commodity concentration of major products; CNManu = commodity concentration of non-manufactured products; CManu = commodity concentration of manufactured products; CTotal = commodity concentration of total products. ***, ** and * indicate significance at the 1%, 5% and 10% levels based on MacKinnon critical values, respectively.

The results of Table 3 suggest that all four dependent variables and two explanatory variables are stationary and found to be integrated of order zero (i.e. I(0)) using ADF and PP tests. The order of instability index is as expected *a priori*, I(0). With the exception of GC5 and CNManu, all other explanatory variables are found to be integrated of order one (i.e. I(1)). According to Engle and Granger (1987), one of the properties of integrated time series is that a linear combination of two or more non-stationary series may be stationary and they are said to be cointegrating equations. The cointegration test is valid only when we are dealing with non-stationary series and the Vector Error Correction model is designed for non-stationary series that are tested to be cointegrated (Gujarati, 2003).

However, instead of pursuing with Johansen cointegration test, we begin with the ARDL approach where we determine the order of lags on the first differenced variables for all 12 models. Using the yearly data over the period 1970 to 2003, the computed F-statistics for each order of lags are reported in Table 4. As shown in Table 4, the F-statistics for models 1, 3, 4 and 7 are not significant in all four lags while the F-

statistics for the rest of the models are significant at different order of lags. To ascertain the appropriate lag order to be adopted, we select the highest F-statistic values which resulted in models 5, 6, 10, 11 and 12 with lag order 3 and models 2, 8 and 9 with lag order 4. The F-statistics in these models confirmed that the lagged variables in the equations are jointly significant and thus they are cointegrated.

TABLE 4. F-STATISTICS FOR TESTING THE EXISTENCE OF A LONG-RUN INSTABILITY EQUATION

Model	Lag 1:	Lag 2:	Lag 3:	Lag 4:
1	1.2664	1.1863	.41877	.32834
2	2.0577	3.1416*	2.0810	10.3615**
3	1.8392	1.9718	2.2187	2.5025
4	1.7396	1.4718	1.5552	1.7787
5	3.2893*	3.1426*	3.3902*	2.7204
6	3.0976*	2.7799*	4.5240**	1.4360
7	1.6672	1.7022	1.4570	1.7102
8	2.5438*	1.8146	3.2059*	22.6547***
9	2.0240	1.3712	2.3917	6.6947**
10	1.2707	2.2595	5.8753**	5.2833**
11	2.0082	2.3838	8.2464***	4.8357*
12	2.0627	2.2394	10.9515***	5.0372*

Notes: The asymptotic critical value bounds for the F-statistic are adopted from Pesaran et al. (2001) under Case II: restricted intercept and no trend; number of regressors=3 where ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

In the next analysis, after establishing cointegration, we use the pre-determined lag orders to estimate the respective models. In doing so, we rely upon Akaike's Information Criteria (AIC) as our model selection criterion. As evident in Table 5, the explanatory variables that cointegrate with the instability index are share of primary commodity exports (PCC) in models 8 and 9 and total commodity concentration (CTotal) in models 10 and 11. The instability resulting from trade dependency consequent from trade concentration is likely to inhibit sustainable development. The concept of sustainable development is a very pragmatic one and hence understood not only from the perspective of continuity at the same or higher rate but also from that of the continuity even when environmental factors are taken into account. (Jacob, 1994, Brown et. al.1991).

TABLE 5. LONG-RUN COEFFICIENT ESTIMATES

	Model Selection Criterion (AIC)			
Variables	Model 2 (4,4,4,1)	Model 5 (3,3,0,1)	Model 6 (3,3,0,1)	Model 8 (4,4,0,3)
PCC	-189.86 (-.782)	-1153.2(1.089)	-736.3 (-1.292)	-8472.4***(-2.939)
CMajor	3207.0 (1.319)			-2645.8 (-.961)
CNManu		1300.9 (.984)	587.9(.697)	
GC1	11905.2(1.491)	19752.8 (.983)		20600.2 (1.008)
GC.3			14440.7(1.105)	
Constant	-612032.8 (-1.443)	-767722. (-.958)	-508837.1(-1.059)	-31734.3 (-.058)

	Model Selection Criterion (AIC)			
Variables	Model 9 (4,4,0,3)	Model 10 (1,0,3,1)	Model 11 (1,0,0,1)	Model 12 (1,0,0,1)
PCC	-7473.5** (-2.911)	-4081.4 (-.889)	-49.3525 (-.023)	-2261.5(-.647)
CMajor	-1789.7 (-.635)			
CTotal		9983.4*(1.830)	8857.1** (2.099)	5314.1 (.819)
GC5		-17353.6(-.588)		
GC1			-55146.2 (-1.582)	
GC.3	12586.6 (.581)			-66279.2 (-1.188)
Constant	209867.5 (.383)	902161.8 (.490)	1961030 (1.349)	2532009 (1.055)

Notes: ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Figures in parentheses represent *t*-values.

Our empirical findings in Table 5 suggest that Malaysia despite being too-much trade dependent could minimize its negative effects on her long-run sustainable development since mid-1980s[iii]. The pattern of trade linkage between Malaysia and her major trade partners significantly explains this. Her major trade partners have been enjoying a purchasing power proxied by per capita GNP that is much higher than that of Malaysia for quite some time. On average, the North American and European trade partners enjoy six to eight times as much purchasing power as that of Malaysia for last three and a half decades. Similarly, her other non-ASEAN Asian partners namely Japan, Korea and Hong Kong have also been enjoying three-four times as much purchasing power as that of Malaysia.

In order to help a small but high trade dependent economy like Malaysia to remain immune from the negative effects of instability suffered by her major trade partners, three measures are recommended. Firstly, the continuous effort to remain competitive by maintaining productivity higher than production cost. Secondly, to diversify as well as broaden the industrial base so as to capture the emerging demand from the rest of the world and thirdly, to find new markets for new products. These measures, in the presence of right macro-economic policies supplemented by increasing foreign direct investment with intra-regional trade paved the way for market-friendly approach backed by a number of liberalization measures.

CONCLUSION

Based on 28 most important commodities of exports it appears that Malaysia has yet to reach the level of complete diversification. Nevertheless the results show that the coefficient of commodity concentration has declined from 78.4 in 1959 (Massel, 1964) to 45.34 for the period of 1970 to 2003. This decline exhibits the trend of Malaysia economy moving from heavy reliant on the so-called twin pillars of rubber and tin to agricultural diversification and manufacturing as well as services sectors.

The coefficient of geographic concentration is calculated on the basis of three alternatives; 5 percent, 1 percent, and 0.3 percent of exports. The higher geographic concentration coefficient at 5 percent level of exports suggests an increasing trend towards limited trade partners particularly when the second period (1986 to 1998) is compared with the first period (1970 to 1985). However, there is a decline in geographic concentration at all three levels of exports destination in the third period (1999 to 2003). The decline suggests trade diversification in which Malaysia is expanding her trade exports by having more trading partners. The ARDL model as introduced by Pesaran et.al. (2001) and as utilized by Bahmani-Oskooee and Kara (2005) to estimate income and price elasticities of trade for 28 countries is employed to explain the instability of export earnings models. The ARDL approach to cointegration does not require the variables to be integrated of the same order. Based on our analysis, we have identified the potential explanatory variables that cointegrate with instability index. The results show that PCC and CTotal exhibits co-movement relationship with the instability index.

When the instability overtime is regressed on disaggregated commodity concentration (CMajor, CNManu, CManu and CTotal), different levels of geographic concentration (GC5, GC1 and GC03) and primary commodity concentration (PCC), the coefficient of PCC emerged as a significant determinant of instability. However, when the instability is comprehended from the perspective of overall concentration (i.e. ITotal), the total commodity concentration index (CTotal) appears as a significant explanatory variable in explaining the export earnings instability. As long as the country's trade link exists with economies having sound and broad industrial base and the domestic macro economic fundamentals are pragmatic, having a balance between cost and productivity, trade dependency may not be harmful particularly in the short term. But given the uncertainties of geo-political power structures being enjoyed by a handful of super-powers, an effort to attain a domestic demand led, sustainable and moderate growth rate is worth-considering from long run perspectives.

APPENDIX

DESCRIPTION OF DEPENDENT AND INDEPENDENT VARIABLES FOR ARDL MODELS

Model	DependentVariable:	Independent Variable:		
1	IMajor	CMajor	PCC	GC5
2	IMajor	CMajor	PCC	GC1
3	IMajor	CMajor	PCC	GC03
4	INManu	CNManu	PCC	GC5
5	INManu	CNManu	PCC	GC1
6	INManu	CNManu	PCC	GC03
7	IManu	CManu	PCC	GC5
8	IManu	CManu	PCC	GC1
9	IManu	CManu	PCC	GC03
10	ITotal	CTotal	PCC	GC5
11	ITotal	CTotal	PCC	GC1
12	ITotal	CTotal	PCC	GC03

ENDNOTES

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[1] "Small country" is defined by Simon Kuznets as one whose population number is less than ten million.

2.Developed country is defined arbitrarily as a country whose per capita annual income exceeds US $300 (According to the figures of the UN Per Capita National Product of 55 countries 1952 - 1954).

3.These important studies talk on the success cases for Malaysia in particular and Asia in general compared to Latin American failed cases. (See Hughes, focusing on Asia; Patel focusing on East Asia and Ariff on Malaysia - all in Asia Pacific Development Journal, vol.1, No. 1, June 1994 (op.cit.).

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